

# The Book Of The Pulpit





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The Story of Building a New Pulpit for the  
Unitarian Universalist Fellowship of Redwood City  
2001 – 2009

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First Published September 2009  
San Carlos, California

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Back cover photograph courtesy of:  
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# Introduction

The full story of building the Pulpit is very long, spanning nearly a decade. As told in this volume, it is incomplete. Some information has been lost with time and memories tend to accentuate the positive and repress the negative. There are related back stories about the church, our community, and the builders. It's all too much!

This telling of the story has been organized to address the different perspectives of the readers.

- Some readers will just want an over view.  
These individuals should skim through the first section, then thumb through the narrative portion looking at the pictures and reading when something catches their interest.
- For those who want a little more detail.  
Read the first section and skim the narrative until you reach Saturday, July 25, 2009 then start reading in earnest again.
- Historians and Woodworkers will want it all.  
Just start reading.





# Forward

When I arrived at the Unitarian Universalist Fellowship of Redwood City (UUFRC) in 1994, there was a pulpit – of sorts. It consisted of a wooden desk with a square wooden lectern on it. The microphone was held by a chrome stand with a cord that dropped to the floor and ran to the back of the chancel. That was the pulpit and had been for many years.

At that time Judy Wells was a half-time Ministerial Consultant, and for many years before that UUFRC had been a lay-lead community. In 1998, we called Rachel Anderson as our first full-time minister in many decades. This change sparked a new view of what our community could be. This in turn became reflected in how we viewed our church and that led to initiatives to improve our facilities:

- Replacing the wooden front doors with glass doors that would be more welcoming.
- Remodeling the office to make it more usable and accessible.
- Remodeling the Social Hall to provide more efficient storage.
- Painting all of the rooms to create a cheerful, comfortable environment.

Eventually this energy manifested itself as a desire to replace our desk and lectern with a pulpit befitting the growth and spirit of our church community.

As true Unitarian Universalists, our desire was to use an open process that would yield a pulpit design better than that developed by any one person. Of course there was also the risk that “design by committee” would result in the worst of all possible designs rather than a collaborative work of art and function.

What resulted was indeed a design better than any of the original individual proposals. This did not come about without struggle. There were grave concerns about our ability to fabricate the final design and meet all the requirements. But the grace and simplicity of the shape “felt” so right that we had to go for it.

So three intrepid wood workers: Cal Sloan, Charlie Zimmerman and I, fortified with some fine walnut boards donated by Carolyn Chaney, started off on an effort that would be more difficult and take far longer than we ever imagined.

In Faith,  
John M. Cooney  
San Carlos, CA  
September 2009



# Section 1



In which we address what, why  
and a little about how



# Ideas

Cal, Charlie and I drew the first napkin sketches for a new pulpit in the snack bar at the 2001 Woodworking Show held in the San Mateo County Expo Center. Attending the show had become an annual pilgrimage for us – a woodworker has to have tools after all, especially power tools. But walking the cement floor for hours takes its toll, so we were taking a break from the demonstrations and had started talking about a new pulpit.

This informal conversation would continue into 2004 when it seemed like the time was right to commit some additional energy to the project. If it was going to happen, we three would have to make it happen.

The Building Committee held the first congregational meeting to talk about a new pulpit following Worship Services on Sunday, April 11, 2004. We had a good turnout and focused mainly on two topics: requirements for the new pulpit and how proposals should be submitted. We decided simple hand drawings would be adequate.

## Requirements

I am an engineer at heart and a manager by profession, it is not in my nature to do a project or call a meeting without some forethought and planning. Hence, I prepared a set of notes for the April meeting with some initial thoughts on pulpit requirements. My expectation was that a few examples would get others to thinking and, all being UU's, I knew that a lot of imaginative ideas would take off from there.

Following the meeting I assembled some minutes that summarized our conclusions.

- **Talking Heads:** A big point was made that speakers looked like talking heads behind the current pulpit.
- **Eyes:** The surface holding speaking notes must not be too far from the speaker.
- **Many Sizes:** Presenters come in all sizes. Two mechanisms for addressing this were discussed: integrated steps that could be quickly pulled out or pushed back, and a height-adjustable reading surface.
- **Movable:** Light-weight enough that two people can safely carry the pulpit down from the chancel.
- **Lighting:** Was the ambient light on the chancel sufficient; was built-in lighting needed; or would a small “book light” would be adequate to provide additional light? The consensus was that built-in lighting was not required.
- **Microphone:** No microphone stand; try Pressure Zone Microphone (PZM) approach.
- **Shelf Space:** Provide out-of-sight storage space for hymnal, sermon, water; etc.

- **Reading Surface:** Wide enough for at least three 8.5"x11" pages side by side.
- **Foot Space:** Provide room for the speakers' feet (like counter kick space) to prevent toes from bumping into structural elements.
- **Banner:** Provide a means to hang easily-changeable cloth banners at the front of the pulpit.

Along with discussions regarding a new pulpit, the idea of having a free-standing floor chalice was discussed. Currently, the chalice sits on the desk next to the lectern. When the desk goes away, where does the chalice go?

## Carolyn's Gift

During these meetings Carolyn Chaney said that she had bought some walnut many years ago for a project that was never constructed. It was good wood, well aged, dry and in thick unfinished boards. She said we could have this material for building the pulpit.

This was an amazing gift, walnut boards of this size and quality at current prices might have made the project prohibitively expensive – or force us to run a special fundraiser. Carolyn's generosity removed one huge concern and enabled us to start work much sooner than we had expected. *Thank you, Carolyn!*

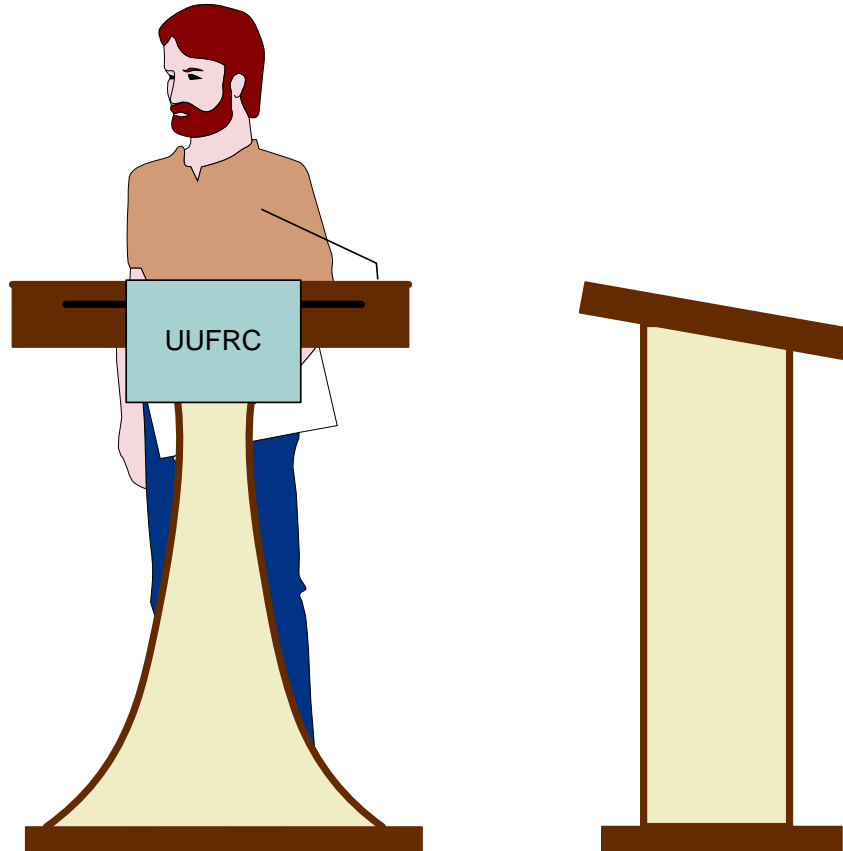
## Submissions

All in all we received about 15 design proposals submitted by seven individuals. These were posted in the Social Hall and the Building Committee held two follow-up meetings to try to choose one. Unfortunately, we were unable to reach a consensus. Huge tensions arose among what different people liked, how the requirements were addressed, and what people thought could be built. This was among the hardest times in the project – the project stalled.

Eventually, however, some trends in the proposals became evident. A vast majority of the proposals involved curves. Building fine wooden structures with large curved surfaces is daunting, I, for one, was just plain scared to try.

## Closure

Time has a way of working miracles. As we mulled it over, different ways of building curved wooden surfaces began to present themselves and the idea was no longer so daunting. The trends toward using curves in the proposals started to refine themselves. A synthesis design evolved that was different than any one of the original proposals, yet had a good feel to it and addressed the requirements.



Additional meetings were held to grapple with the design. We built some cardboard prototypes that lead to additional design changes. But the die had been cast, and we now had a basic design and a selection of woods.

We had to overcome several mechanical issues. The most difficult was meeting the requirement for mobility. But this was an “engineering” problem and, therefore, solvable. The form and function had been addressed in an artful way. The project was off again and gaining speed.

# Paperwork

As far back as I can remember, I have gravitated towards engineering. My parents would joke that they needed to buy me two of every toy: one to play with and one to take apart. Sadly, it was not a joke! Most of my toys ended up disassembled, and only occasionally correctly reassembled. But I was never outwardly organized. I have good spatial awareness so if I put something down I remember where it is. This was fine until school forced me to deal with intangibles like homework.

In High School I started making lists of homework assignments for my Math and Physics classes (we will not discuss the other classes). Unfortunately, this skill was not sufficiently robust to get me through my first year of college with anything better than academic probation. I dropped out of college and did volunteer work for two years.

In those two years of volunteer work, I developed a fondness for large complex projects and a desire to finish them. I also discovered that I liked working with people: communicating what needed to be done and coordinating their efforts. I learned how to plan projects and document the resources and logistics needed to complete them.

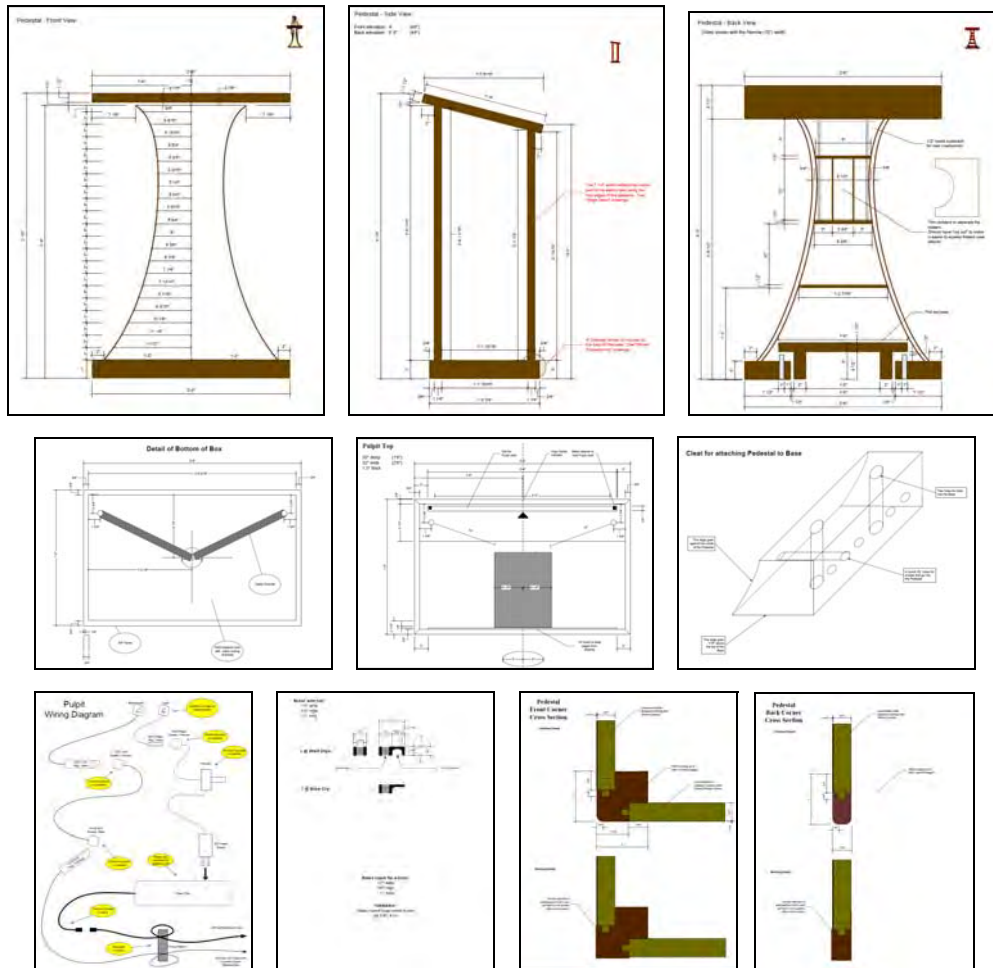
Now I view these skills as both a blessing and a curse. I love engineering, analyzing problems, and finding and implementing solutions. Planning and logistics are automatic as breathing. I look at a problem and see it in terms of the tasks to be done, their dependencies and the resources required. Nice if people will pay you for it, but it tends to cause me to analyze and plan everything rather than spontaneously “just doing it”.

In the case of the pulpit project, these tendencies continue to be both a blessing and a curse. Without hesitation, I spent hours generating documentation to organize the project. I couldn't even call the opening meeting to talk about the pulpit without preparing detailed agendas, requirements, and design proposals.

Once the design was agreed upon, I spent hours creating measured drawings and writing up the construction and assembly steps. For something as complex as the pulpit this was a blessing. It's no fun to walk into the woodshop with the intent of building something and then spend hours just figuring out where to begin.

In all, there are 40 pages of drawings and documentation on how to build the pulpit. This is not a complete set, there could easily be twice as many drawings and sub-assembly write-ups. But Charlie, Cal and I have worked together on enough projects that we don't need absolutely every detail written out.





Now a truly experienced builder knows that not having everything, and I mean everything, planned in advanced is a sure fire invitation for **OOPS**<sup>1</sup>. On the other hand, a truly experienced builder knows that it is simply not possible to plan everything in advance and that **OOPS** is inevitable<sup>2</sup>. The bottom line is that at some point you just have to get started and be prepared to learn from the School of Hard Knocks. Shops are places for creating sawdust!

<sup>1</sup> A shop term for which you need to earn the translation.

<sup>2</sup> Among other things, **OOPS** is a context-sensitive restatement of Murphy's Law with extensions for spontaneous combustion in a Shop environment.

# Tools

To be honest, there were times when I wished that a new pulpit would spring forth out of the air, complete and perfect down to the last detail. But, alas, it was not to be so, the pulpit had to be built: Built with muscle, and sweat, and wood, and metal, and above all **TOOLS!**<sup>3</sup> You can not do a proper bit of work without the correct tools.

Naturally, if you encounter a task for which you are not properly equipped then, as a good and proper craftsman, you must acquire the appropriate tool. Sadly, there are those who do not understand this basic axiom of craftsmanship. Rather, they view tools in the context of an expense and question the cost effectiveness of acquisition. While we respect these individuals as vital members of our community, we continue to hope that they will quickly come to their senses as they are simply NUTS!

On Sundays we come together in the Sanctuary for Worship. Likewise, Tools do best if they reside and are used in a Shop.

The UUFRC has been fortunate in that one of its members, Charlie Zimmerman, has a well refined understanding of **TOOLS** and **SHOPS** and has over the years done a yeoman's job on both fronts. Charlie loves to make furniture and we have done many projects together over the twenty plus years we have been friends. You can see some of the results of his efforts at UUFRC: from drawer dividers in the kitchen to the cabinet for the sound system, and now in the construction of the pulpit.

We had been eagerly awaiting the challenge of the Pulpit. We did a major reorganization of Charlie's Shop (formally a garage, but that was several decades ago) to create a larger assembly area, improve electrical distribution and make all of his heavy tools more mobile. It is a fine Shop to work in and totally up to the challenge of the Pulpit.



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<sup>3</sup> In truth it is also built with an appropriate amount of *OOPS* and associated lessons from the school of hard knocks.

# Anatomy

The pulpit is made up of 23 separate parts and sub-assemblies that are attached with screws and bolts to allow disassembly for maintenance (which we hope is never needed).



- Base
  - Glued sub-assembly
  - Solid core of birch plywood
  - Eight-inch hand-cut walnut veneer
- Pedestal
  - Glued sub-assembly
  - Hand-formed curved maple plywood sides
  - Four curved walnut trim rails
  - Birch plywood substrate front
  - Eight-inch hand-cut curly-maple veneer front
- Reader Board
  - Glued sub-assembly
  - Solid birch plywood core
  - Eight-inch hand-cut walnut veneer
  - Brass page rest bar
- Rare-earth magnets to hold up banners
- Retaining shelf
- Retaining shelf trim
- Walnut light-dimmer mounting block
- Three maple plywood shelves
- Walnut trim for the three shelves
- Walnut microphone and light power-connection block
- Walnut step
- Walnut reader board electronics connection block
- Three walnut base/pedestal mounting cleats
- Six electrical connectors for microphone and light.

# In Brief

This is a quick summary of the major milestones in the project. It is intended to make quick reading.

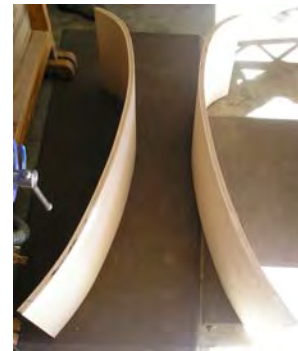
**2001** - Cal, Charlie and I start talking about a new pulpit.

**April 2004** – Conduct open meetings at the Fellowship to talk about design and function. Carolyn Chaney donates walnut boards to the project.

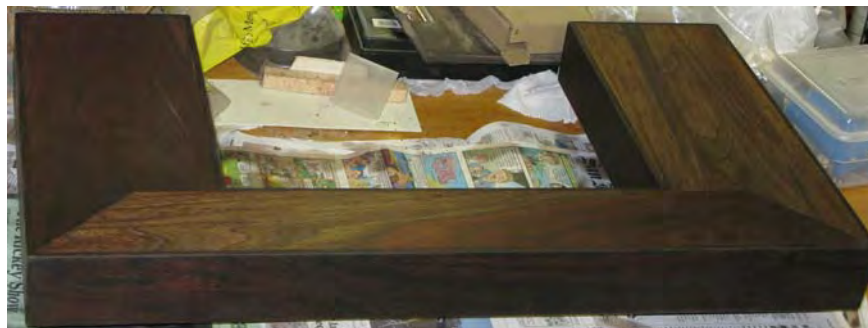
**May 2005** – Prepare design and construction documentation.

**July 2005** – Start building the curved maple sides of the pedestal. We need  $\frac{3}{4}$ " plywood but that is too thick to bend so we have to build our own plywood from layers of thin maple plywood for the exterior and “wiggle board” for the core.

First we go shopping for the materials. Then we build the 24-inch-high, 22-inch-wide and 52-inch-long form that is referred to as “The Casket”. In all there are 72 parts and over 200 screws. Its internal ribs will force the plywood into the correct shape as the glue dries. This is our first big milestone.



**October 2005** – The two curved sides are complete and we start working on the base. We build the core out of birch plywood, then cut our own eighth-inch veneer from the walnut using Charlie’s band saw. Finally we cut the veneer to shape and glue it up. Simple compared to making our own plywood.



**February 2006** – Cut our hand-made plywood sides to length. This is hard because it's a curved surface. Our solution is to place the plywood on part of The Casket, and modify Charlie's radial arm saw for making the cut.



**March 2006** – Start of a six month hiatus from working on the Pulpit. Charlie and I had to put in lots of overtime for our employers then I broke my leg and ankle.

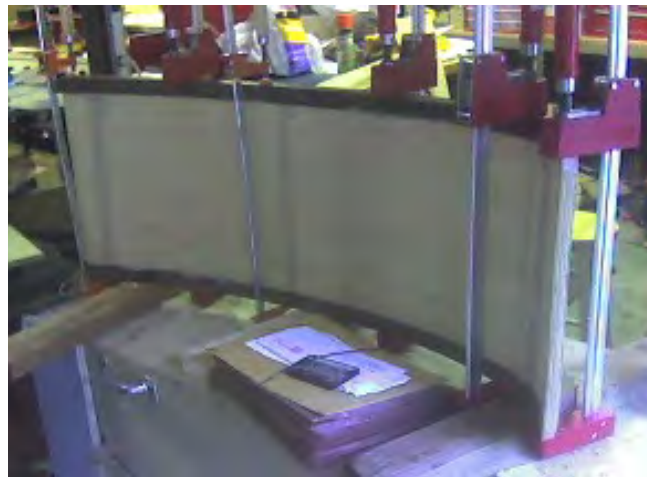
**January 2007** – Plan how to cut the walnut rails for the sides of the pedestal. Constructing these four rails turns out to be the most difficult part of the project. We built three complete prototypes before figuring out how to make these cuts. We were very frustrated at times.

Finally we built our own attachments (tools) for the router as well as creating multiple templates for each cut. In some cases, we used Bondo to make sure the template was an exact match of the existing curve. It was hard!

The front rails required four cuts each, each requiring a different template with different curves that matched the shape of the corresponding curved side. The back rails required only two cuts, but even these required multiple templates.

**January 2008** – Finish gluing the walnut rails to the maple sides. Thus ends the hardest part of the project and the start of the second hardest: building the front of the pedestal.

Once again we need to make several prototypes and templates, again we used Bondo to get the curves exactly right. Ultimately we create a substrate out of birch plywood that we will use to back the curly-maple front. We decide to defer working on the curly maple until we have installed the shelves and made the pedestal a solid free-standing unit.





**June 2008** – Finish the shelves. The shelves are attached to the pedestal with pocket screws to create a tight free-standing unit.

Next we cut the curly-maple veneer. Because the grain in the curly-maple is constantly changing, it's hard to control when cutting, and susceptible to damage. So, once more we need to build some special tools first, in this case a large 7" fence for keeping the wood parallel to the band saw blade.



**October 2008** – Complete another critical milestone. We have book-matched and glued the curly-maple to its substrate. Before gluing it to the sides, however, we trim up the back walnut rails.

**January 2009** – Start work on the reader board.

**February 2009** –The tasks get smaller and less complex. We are at a point where we can work on different parts of the project independently, such as the walnut trim for the shelves and the reader board.

**March 2009** – Build a prototype for the step. Two lessons we have learned: make a drawing and build a prototype even if you think you know what you want and that it will be simple. It never is!

We have also started the third-most scary part of the project: Trimming the top of the pedestal to hold the reader board. For over a year, we have been talking about how to approach this task. Finally we decide to encapsulate the pedestal in a framework, or jig, that supports a reference surface for the router. Then we will gradually mill down the top of the pedestal to the correct height and angle.



It takes two sessions to build and reinforce the jig, and another three sessions to do the milling. But it works!

**May 2009** – Work on several tasks concurrently:

- Mill the top of the pedestal
- Put banding on the reader board.
- Build the step.

The end is in sight--it's getting very exciting.

**July 2009** – Fabricate and mount the reader board retaining shelf along with the mounting cleats to hold the pedestal to the base. At last we have our first full assembly of everything but the electrical components. It looks *so* fine.

We are also making the mounting blocks for the electrical components and attaching brass retaining clip for the XLR cable.

Charlie has also been trying different finishes on sample boards. After four attempts, we find a finish that looks good on all three of the different woods: Carolyn's walnut, the clear maple on the sides, and the curly-maple on the front.

Everything but the pedestal has been sanded and is ready for the finish. The base and reader board are the most critical as they will likely get the most abuse. The first coat of finish really brings out the grain in the walnut, and the more coats Charlie puts on, the deeper the texture and color get. It looks wonderful.

**August 2009** – Install the electrical components in the pedestal, sand the pedestal and prepare it for finishing. There is nothing left to do but complete the finishing and that just takes time.



# How Long?

All told, the project spanned nearly a decade from 2001 to 2009. Of course, we did not work on the pulpit full time for that duration.

Actual construction started in 2005. We worked on Saturdays when we could. I figure we spent about 140 days in the Shop, which translates to around 2,100 hours.

We also spent alot of time outside of the shop doing such things as:

- Designing.
- Preparing construction documents.
- Planning.
- Purchasing materials.
- Keeping a history: *The Book of the Pulpit*.

We also worked occasional evenings, Sundays, holidays, and weekdays, especially toward the end of the project.

How much time did we spend working? I don't really know. But I expect it approaches 2,600 hours in total.



# Community

Who built this pulpit? No one person – it exists because of the UUFRC community, so in a sense the entire community built it. But who did the labor? Without question, specific individuals spent hours working on proposals, buying materials, woodworking, finishing, sewing, encouraging.

Yes, yes, we know all that, but **who built it?** On the inside of the pulpit you will find a small brass placard that reads:

**Dedicated September 2009**  
Design & Construction:  
**John M. Cooney**  
**Cal Sloan**  
**Charlie Zimmerman**  
  
Walnut donated by:  
Carolyn Chaney

These individuals contributed the lion's share of the effort to the project; but many others contributed in a wide variety of ways. Reflect on the entire story and all that occurred to bring the idea of a pulpit to fruition:

- Identifying requirements
- Proposing designs
- Struggling to find solutions to design problems
- Donating materials
- Donations to purchase materials
- Loaning tools
- Working the wood
- Sewing banners for the front
- Moral support in the midst of **OOPS!**

# Dedication

On Sunday, September 13, 2009, the pulpit was presented to the congregation and dedicated by our minister, the Reverend Julia Older.

Late the proceeding evening we moved the pulpit into the sanctuary and draped it with a large blue cloth. Everyone would know it was there, but not what it looked like – we wanted to build a little suspense.

The Sunday service started as usual except that Rev. Julia spoke from a microphone off to the side of the new pulpit instead of behind it. After the usual welcoming and chalice lighting, it was time for the Dedication.

Because so many new members joined the Fellowship during the years that we were building the Pulpit, Cal gave a short history of the project. When we finally unveiled the pulpit, the audience gasped, cheered and gave a standing ovation<sup>4</sup>.

After everyone returned to their seats, we demonstrated all the features of the pulpit: microphone, light, magnets to hold display cloths, shelves, step, and the *Book of the Pulpit*.



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<sup>4</sup> One member commented that this was the first time he had ever seen a standing ovation for a piece of furniture.

When, eventually, the room settled down, Reverend Julia took her place behind the new pulpit and gave the formal dedication.



**Reverend Julia Older:**

“When our Fellowship is at it’s best, it is not only a place of safety and celebration and solace, it is a community of fellow travelers which calls us forward. Which asks us to be more of who we are and to step up bravely using our talents to serve the world. We aspire to be a place of inspiration where hope is renewed, where friendships deepen, where talents are discovered and creative expressions flourish.

This pulpit represents all of these things.

John, Cal, and Charlie began this project for the challenge of doing something new and different and artistic in the woodworking medium, for the pleasure of spending time together, and, of course, our existing pulpit was old and very plain.

Today we unveil and dedicate this pulpit as a work of art born out of dedication to this community, created with skill and given in love.

May all who stand at this pulpit have the freedom to speak the truth in accordance with Unitarian Universalist principles.

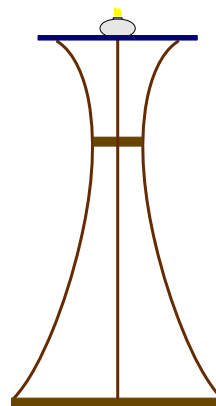
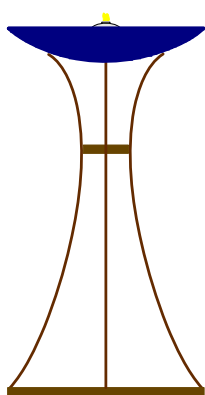
And may all who worship here receive the challenge and encouragement and blessings their hearts need.

Blessed be.”

At long last, the project is complete.



Well, yes, there is another project...  
but that will be a different story.



# **The Narrative**



**2005**

## Saturday, July 9, 2005

You can't build without wood. Carolyn Chaney is donating dark walnut for the top, base and trim. But we need some super-nice curly maple for the front and some good clear maple veneer plywood for the sides. As much as we hate shopping, if it has to be done at all, at least it's for wood (or, of course, tools).

Sending craftsmen out shopping for wood is just plain dangerous. It's like turning a book club loose in Powel's used book store in Portland, Oregon. If tremendous restraint (sometimes physical) is not used, you exit with lots of good stuff but without funds to pay the rent.

The intrepid shoppers, John Cooney, Cal Slone, and Charlie Zimmerman, are off! We visit three stores:

### **Global Wood Source**

1575 Terminal Ave.  
San Jose, CA 95112  
408-392-0573

### **Southern Lumber Company**

1402 Monterey Hwy  
San Jose, CA 95110-3696  
408-297-9663

### **Woodcraft**

1121 B Industrial Road  
San Carlos, CA 94070  
650-631- 9663

While talking to Eric McCrystal at Woodcraft, we learn that we should also visit MacBeath Hardwood in San Francisco. But the day has gotten old and we have spent enough time looking and tons of energy exercising self-restraint. It's time to call it a day.

## Saturday, July 16, 2005

Construction starts! Cal has already made a run to the lumber yard and picked up materials for making templates and a bending jig for the sides. The first task is to construct a template for the curved sides of the pedestal.

We rough cut the eighth-inch hardboard, being the first sawdust of the project, it was a landmark event worthy of celebration. But we were on a roll so we kept going! Next the tedious work of





transferring 22 measurements from the drawings to the material is done with great care to within a 32<sup>nd</sup> of an inch.

**OOPS!** Pencil marks do not show up well on the dark hardboard. We should have painted it white first so we could have a good contrast. Time to switch to a Sharpie marker. This works better but you still have to get the light at just the right angle to see the marks using the glare off the surface. Our first of many lessons!

We use a flexible board to draw a smooth curve across all the points and the layout is done, so it's back to the shop for more sawdust. We use the Scroll Saw to make a rough cut then file it down to the line. It takes hours but by the end of the day we have our master template.



## Saturday, July 23, 2005

Before building the jig to make the sides of the pedestal, we need to buy wood that will bend so it's time to go shopping again. This time we will start at MacBeath's and try to buy everything in one stop.

We drive to San Francisco and easily find the location:

**MacBeath Hardwood**  
2150 Oakdale Avenue  
San Francisco, CA 94124  
415-647-0782

They have many wonderful veneers but, alas, not what we need. They check the computer for us and claim that they have everything we need at the Berkeley store. We hop back in the car to make a quick run over to Berkeley. It's late morning so traffic shouldn't be too bad given that we are starting in San Francisco.

**OOPS!** It seems they have been doing construction on the lower level of the Bay Bridge and it doesn't matter what time of day you go, the traffic starts backing up at Hospital Curve. But we are committed and the three of us (John, Cal and Charlie) have all kinds of good stories to share while crawling along in traffic, so we endure.

Success in Berkeley: they have some nice quarter-inch maple veneer plywood and the wiggle board needed for the core of the laminated sides. Wiggle board is strange stuff. It's a kind of plywood made with the grain all going in one direction so it is super flexible in one direction. It's specially designed for laminated construction and this is the only place we have seen it for sale locally so we snap up two sheets. Life is good!

But the selection of curly maple is sad. Without question, the best samples we saw were at **Global Wood Source** down in San Jose. Well, we don't need the curly maple right now, so we tie the plywood to the top of Cal's minivan with some twine provided by MacBeath's and head back to the Peninsula.

We have learned at least one lesson already today, the Bay Bridge was *packed* going west, so we drive down 880 to the San Mateo Bridge.

**OOPS!** There is a complex relationship between the aerodynamics of a minivan, the wind blowing from San Francisco Bay, the tensile strength of twine, and the desire of plywood to fly unencumbered through the air. While we share a deep respect for the desire of all living things to find their own spiritual path, we do not intend to let our plywood take flight. Two unplanned stops at the side of the road later, we dump the twine for some seriously heavy climbing rope. The ride home down 880, across the bridge and up to the Shop continues with the plywood appropriately subdued.

## Saturday, July 30, 2005

Today we get to cut wood! The Plan of Record is to complete two tasks:

1. Construct a sample using the laminated materials. We want to see what the final thinness is and see how it will all glue up.
2. Build the outside half of the bending jig.

Cutting sample pieces of the wood to make up the laminated sides of the pulpit was simple. Then we glued up the wood and clamped the sample.



It's a little hard to tell from the picture below, but there are four parts to the laminate plus a protective layer on each side. It goes like this:

1. Eighth-inch hardboard protective layer.
2. Eighth-inch plywood with maple veneer.
3. Quarter-inch wiggle board.
4. Quarter-inch wiggle board.
5. Eighth-inch plywood with maple veneer.
6. Eighth-inch hardboard protective layer.

Life in the Shop is good!



The bending jig for the sides of the pulpit consists of two units between which the wood to be laminated will be compressed and held in shape while the glue dries. Each half of the jig consists of five parallel ribs cut to reflect the final shape of the laminate. The jig must be sturdy enough to take the many hundreds of pounds of pressure that will be applied to the laminate, but cheap because it gets used twice and then thrown away. Such is the short life of a jig.

We start with the outside half of the jig because it will be an exact inverse of the master template we constructed. The technique is to create an inverse pattern to the master and then use that to cut the five ribs. The first step in creating the inverse template is to cut a “dummy” with a router using the edge of the master template as a guide.

**OOPS!** Our master template is made of flexible eight-inch hardboard and we cannot find a router collar or flush-cut bit that will follow such thin material. After several attempts it is time to accept this lesson from the School of Hard Knocks. We'll have to make a run to the store and buy some half-inch hardboard we can use to create the templates for cutting the ribs.

We use the master template to trace the shape we need on the half-inch material and start cutting the template for the ribs again. We make the first pass with a sabre saw and then file the template down to the traced line.

Once the template is complete, things really start to move. With a circular saw, we rough cut five blanks of  $\frac{3}{4}$ " MDF (Medium Density Fiberboard, a.k.a. Bergerot Board) from which the ribs will be made. We clean up one edge using the table saw. Next we trace the template on each board and rough cut the boards using a saber saw.



The template is then clamped to each board and a router with a with a flush-cut bit used to trim the ribs to exact shape and size.

By the end of our work day we finished five ribs for the outside half of the jig.

We did not make the progress we had hoped for but lessons from the School of Hard Knocks take time. However, there was sawdust to sweep up so life in the Shop is good!

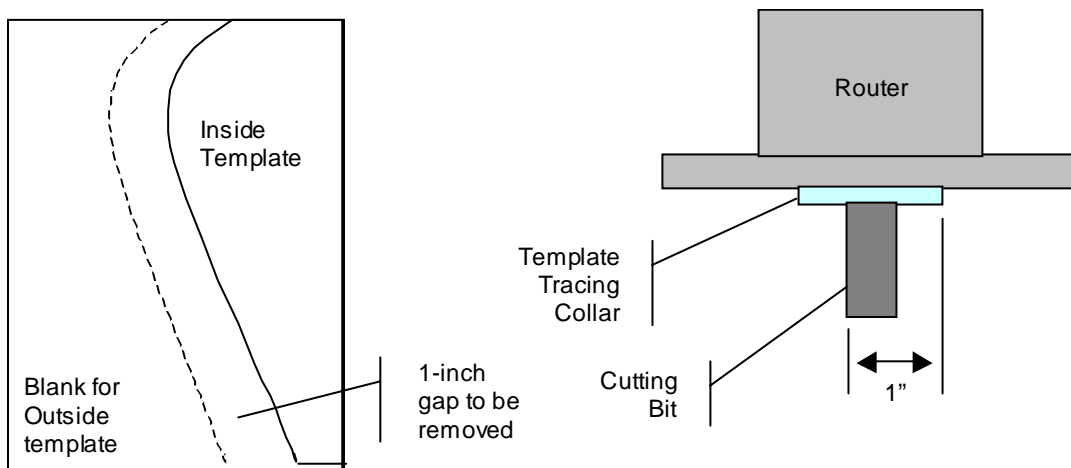


## Saturday, August 13, 2005

We missed a weekend due to illness and family duties. But “we know this rose will open” so we continue on undaunted with a desire to make up time. The first task is to construct a template for cutting the ribs on the inside half of the bending jig.

This is tricky, the inside and outside curves are **not** identical because of the thickness of the wood being laminated. We want to use the template for the ribs of the outside half of the jig as a guide, but we need to cut with an offset from each point along its curve. Returning to the sample laminate we glued up on July 30, we measure the thickness and it is one inch thick (we are talking less than a 64<sup>th</sup> of an inch off). So we need to find a way to follow the inside template with a delta of one inch. This looks like a job for the router.

But it’s not that simple, when cutting with a router you usually need to have the finished edge on the same side as the template you are tracing. In this case we need just the opposite. Back to paper and pencil to determine the size of router bit and tracing collar to use to get the required cut (see figure below).



Router bits and tracing collars are measured in diameters. So we need to find a combination such that:

$$\frac{1}{2} \text{The diameter of the bit} + \frac{1}{2} \text{The diameter of the collar} = 1"$$
$$\frac{1}{2} \left( \frac{5}{8} \right) + \frac{1}{2} \left( \frac{11}{8} \right) = 1"$$

Fortunately, Charlie owns the right combination of bits and collars to make it all work so we set up the router and start making sawdust.

Solving a problem via a mathematical model is intellectually satisfying. However, in the shop what counts is how it cuts. First task is to do a test cut with the router – success! We cut the master template for the outside jig ribs. Life in the shop is good.

Now we are on a roll so we quickly cut five blanks of  $\frac{3}{4}$ " MDF from which the ribs will be made. Using the new template we trace the line we will be working to, and rough cut (to within  $\frac{1}{4}$ " ) the blanks. Then we reconfigure the router with a flush-cut bit and make the finish cuts using the template as a guide.



Its lunch time and time to work out the details of assembling the rigs into a strong and rigid structure for clamping the laminate. First point of consensus, it's better to way over engineer the jig than to have it go "sprong" when we are clamping up the wood!

We decide that we need more materials:

- Six 2x4s from which we will create separators to put between the ribs.
- Screws – two boxes of 6x2".
- More  $\frac{3}{4}$  MDF to act as assembly plates to keep things in alignment.

We do the shopping, unload the goods, clean up and call it a day. We have made excellent progress. Life in the Shop is good!

## Saturday, August 20, 2005

We cut the materials for framing both the inside and outside of the bending jig. Next we do a dry assembly of the outside half of the bending jig.

**OOPS!** Our arithmetic is a little off, this is precisely why we do dry assemblies! The spacers we cut to put between the ribs need to be a little wider. This is easily corrected by cutting some additional strips from scrap 2x4s and we are quickly back on track.



Sadly, this must be a short work day as we have other commitments. We have to stop after having verified that all the dimensions for framing half the jig are correct. Then there is the inevitable cleanup. On these short work days it feels like we spend half of our time setting up the tools and vacuuming up all the sawdust. Progress this weekend has been slow and we are feeling a little down.

## Saturday, August 27, 2005

We reached a major milestone today – we finished assembling the jig to form the bent laminated sides of the pulpit. Many hours were spent in the shop today to accomplish this - but it is good! Especially, since we had no real **OOPS** today.

First we assembled the inside half of the bending jig. This went quickly as we had cut all of the parts last week.

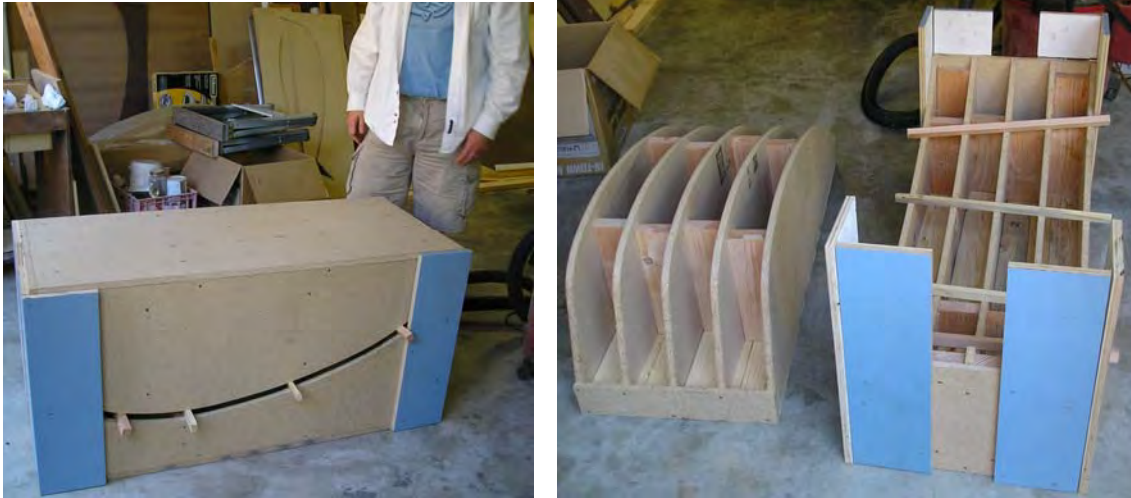
Then we cut one-inch spacers and did a dry assembly of the entire unit to figure out the best way to implement the keys that will align everything when we actually start bending the material.

We decided to put guides in each of the four corners so we returned to the table saw to cut some scrap plywood into the sizes required.

We screwed the plywood forming the keys and assembled the unit. The jig is complete! Life in the Shop is good.







Each half of the jig is very heavy and it takes two people to lift. We will need to fit some handles to the top to make it easier to pick up. We also want to reinforce the tops of the plywood keys in the corners with metal L-brackets to give them extra strength.

When its all done a lot of stuff has gone just into making this form:

Screws	Count	Parts	Count
L-Brackets	24	Press Board	16
Handles	16	Vertical Spacers	32
3 1/2" Deck	15	Horizontal Spacers	12
2 1/2" Deck	15	Concrete Blocks	4
2" Deck	137	L-braces	4
		Handles	4
<b>Total:</b>		<b>Total:</b>	<b>72</b>

Time to clean up, we are very tired and sore from the effort, but it is done. Next week we will cut the laminates and do a dry bending run. If all goes well, the following week we will apply glue and clamp it up!

## Saturday, September 3, 2005

Today was the big test – the dry run for actually bending the sides of the pedestal. Ever the optimists, we started by collecting the walnut to be used in making the base edge trim and top from Carolyn. The plan was that the dry run for bending the sides would go quickly and we would have some energy left to start laying out the walnut base.

We started by putting handles on what we initially called the “Press” (but which quickly became the “The Casket”). It is just too hard to handle the top half without something to hang on to. We also reinforced the top of the corner guides with steel angle brackets.

Next we computed the actual finished size of the laminated materials and make the cuts. Now the fun begins, we put the materials into the Press and it bends a bit. Cal sits on the Press and it bends a little more. I climb onto the Press with Cal and it bends a little more. But we are still a good two inches off and things are not looking good. We jump up and down on the Press but still need another two inches.

We put over 300 pounds of pressure on the Press and still had lots of bending to go!

Time to experiment, we try bending each of the elements of the laminate individually to see where the problems are. The wiggle boards forming the center two elements of the laminate bend to the form easily, we could do that by hand. But the eighth-inch outer protective strips and the two eighth-inch maple plywood strips are a real problem.

There is much mumbling and frustration. Life in the Shop is **NOT** good! Time to break for lunch and have some Guinness Stout.

Taking a break to gain perspective on a problem is always a good idea and this time it pays off. At lunch it occurred to us that when bending you are stretching the material on the outside of the bend, but compressing it on the inside. Since the inside of the bend for one of the maple elements is hidden, we can remove some material by cutting a bunch of shallow grooves with the table saw.

Cutting several parallel channels a sixteenth-inch deep on the table saw is not hard, but it is tedious. However, the effort pays off and when we repeat our dry run it all comes together. The press is closed down tight and it looks right. We decide to leave the test boards in the Press for a week to see how it holds up and what the boards do. Life in the Shop is good.



Next we need to assemble all the materials we will need for glue up next week so we start measuring and cutting.

**OOPS!** Remember back on July 30<sup>th</sup> when we glued up a sample of the laminate so we could get the exact width of what we would be bending? Well, we had taken that off the end of the original stock, it was no longer four-feet by eight-feet, it was now four-feet by seven-feet seven-inches. But we had forgotten all that until we started stacking up the boards for glue up and some were short!

So much for glue up next week. Instead, next Saturday we will have to return to MacBeath Hardwood in Berkeley and get another sheet of wiggle board and eighth-inch maple plywood. ARG!

Time to start cleaning up and discussing how to best use the walnut stock for building the base and top of the Pulpit. We will need to create a cutting plan so we don't make the same kind of mistake we did with the plywood. More paperwork, but the lesson has been learned.

## **Saturday, September 10, 2005**

We got started early today with a run up to MacBeath Lumber to buy replacement materials for the maple plywood and wiggle board. By heading out at 8:00am we beat the traffic and the entire trip was quick and uneventful. This time we had a cutting plan so we had MacBeath rough cut the boards to 2'x8' and they simply slid into the back of the minivan. No repeat of the July 23 flying plywood saga.

Back at the Shop we pop open the Press and get a nasty surprise. The outer maple plywood has buckled in one spot at the line of the greatest curve. This is was a dry run so no real harm done, but it is a concern.

Because the top gets cut at an angle, the part that buckled will be removed anyway. After much reflection we decide to carry on without any changes and hope that the final bending will go better, or at least, equally as well. It always helps to cross one's fingers in these situations.

Time to cut the newly acquired lumber to size for bending. Next we cut a bunch of kerfs<sup>1</sup> into the maple panels so they can bend to the tight curve radius at the top. Next assemble the laminates in the order they are to go into the press. Everything is now ready for glue-up. But that must wait for another day.

## **Saturday, September 17, 2005**

I am out of town on a family trip, but Charlie and Cal carry on with the work aided by Cooper Sloan. It's a big moment in the project, time to glue up the first of the sides. Everything is prepared and laid out. It goes quickly, just a little over an hour from start to finish:

1. Walk through the steps to insure that everyone knows their part.
2. Put down wax paper to protect the press from glue squeeze out. The last thing we need is to have the work piece glued to the press.
3. Mix the glue. This is a special two-part urea resin glue called Unibond 800 that we could only get via mail order. It has a 30-minute working time so it must be done right the first time.

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<sup>1</sup> Grooves that go across the wood perpendicular to the radius of the curve and on the "inside" where the wood gets compressed. This allows the board bend without cracking.

4. Insert the first board into the press: Eighth-inch hardboard protective layer.
5. Insert the second board: Eighth-inch plywood with maple veneer.
6. Apply glue to one side of the first quarter-inch wiggle board and put it into the press.
7. Apply glue to one side of the second quarter-inch wiggle board and put it into the press.
8. Apply glue to one side of the bottom of the second eighth-inch plywood with maple veneer and put it into the press.
9. Add the second eighth-inch hardboard protective layer.
10. Install two screws at the bottom of the boards to prevent them from slipping.
11. Put the top on the press while pushing on the laminates to insure they are fitting correctly.
12. Stand on top to get the initial compression and apply the first set of four clamps.
13. Apply the second set of clamps.
14. Tighten the first set of clamps, then the second set until they can't get any tighter.
15. Done!

Wait and see what happens.

## Sunday, September 18, 2005

Just as I am returning home Charlie, Cal and Cooper have gathered to glue up the second side. The first side has been removed from the press and looks great! Sprits are high and life in the shop is good.

Now I am on the scene with camera in hand. Doing the second side is a repeat of the first so it's important that the same crew does the work. I stand back and take pictures.

Picture 1: The first two parts are in the press:

- Eighth-inch hardboard protective layer
- Eighth-inch plywood with maple veneer





The Unibond 800 glue is applied to the bottom of the first piece of wiggle board with a special foam roller. *The clock is ticking!*

Picture 2: The first piece of wiggle board is placed into the press. The bottoms must be aligned and care taken not to get any glue on the press.

Repeat the process for the second piece of wiggle board.

Picture 3: Add the second sheet of maple veneer plywood. The surface that you see in the picture is what will be visible on the side of the pulpit. Much care must be taken at this point.

Picture 4: The top protective layer of eighth-inch hardwood is in place and the completed laminate is screwed together at the bottom to keep the layers aligned when the pressure is applied.

Picture 5: Pressure is applied to the laminates as the top of the press is put into place. This is a critical step. If any of the laminates bind on the edges of the press they may tear or the wood may splinter.

Picture 6: Time to start clamping. The initial compression is done with easily movable weights so that the top is closed enough for the clamps to be applied. The first clamp goes at the end with the maximum deflection in the wood.

Then work around adding more clamps and tightening until there are no gaps between the laminate and the press. Squeeze and squeeze until it can't get any tighter.





It takes a minimum of five hours for the glue to cure. We leave it for a full day just to be sure and because it meets our personal schedules better.



Here is the result of yesterday's effort. It came out wonderfully. There is a little area at the top where it did not adhere properly but we know how to fix this.

Tomorrow, Monday, we will pop the second side out of the press and (fingers crossed) it will come out as well as the first effort.

## Sunday, September 24, 2005

Today was a review and planning day so no sawdust was made. First we double check the measurements on the two curved sides to insure that everything is as we expect. The photograph is over-exposed but the general shape is apparent. The sides will be trimmed at the top and bottom, pencil marks are barely visible on the edge.

The measurements “as built” matched those “as planned” to within an eighth of an inch over the entire distance of the curve.

Life in the Shop is good.



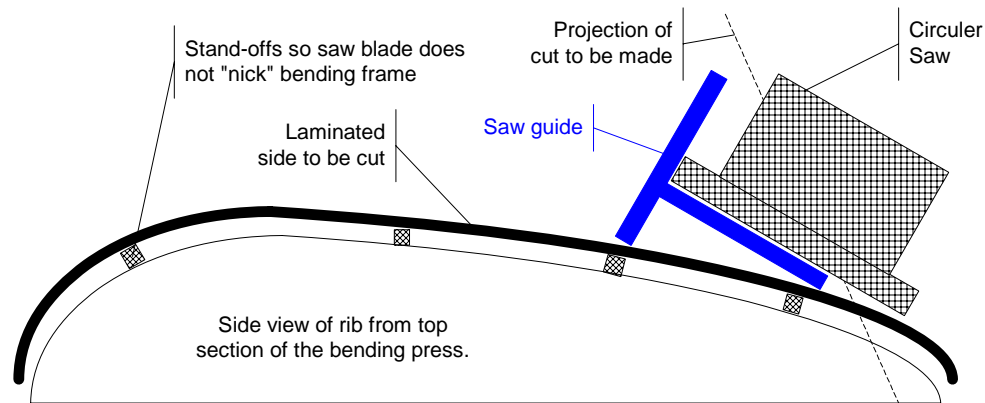
Now on to planning the next steps:

1. Building the base.
  - 1.1. Discuss several approaches to constructing the base and decide to make it solid walnut.
  - 1.2. Review the raw stock and select the boards.
  - 1.3. Sequence of operations (for next weekend):
    - 1.3.1. Cut the planks in half to make them easier to work with.
    - 1.3.2. Plane them to give them finished surfaces.
    - 1.3.3. Rough cut the boards to length.
    - 1.3.4. Glue up the boards.
2. Discuss constructing the walnut top where the papers will sit.
  - 2.1. Agree on a torsion-box technique<sup>2</sup> using solid walnut as an external frame and plywood for dimensional stability on the top and bottom of the box.
  - 2.2. Cover the plywood with an eighth-inch veneer, thick enough that standard (heavy) use should not damage the veneer or poke through it to the plywood.
  - 2.3. Make eighth-inch veneer by re-sawing one of the walnut planks.
  - 2.4. Review the raw stock and select the plank we will use for making the veneer.
3. Decide how to make the final cuts on the curved sides.
  - 3.1. Cutting the sides (top to bottom) is not hard, we'll run it through the table saw with the curved sides up and the edge against the fence.

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<sup>2</sup> A torsion Box allows for a large strong box that does not weigh very much. It consists of this solid top, bottom and sides. The interior is made of dividers that create a mesh holding everything together but leaving lots of empty area. Very strong, but very light. (see <http://www.finewoodworking.com/Community/QADetail.aspx?id=26506>)

- 3.2. Cutting the bottom where it meets the base is more difficult. The current plan is to use half of the press for stability and create a jig to guide the circular saw. It would look something like the following diagram:



- 3.3. Cutting the top is the most difficult – it's a compound cut in three-dimensions over the sharpest part of the curve! Our only solution thus far is to make a rough cut by hand using a coping saw then trim it “down to the line” using hand planes and rasps. This has to be done after the unit is assembled as the edges of both sides and the front must all align perfectly.
4. Start looking for the quilted maple to be used in the front of the Pulpit. This needs to be an exceptionally fine, highly-figured wood. We agree that despite the financial and emotional risk, weekly visits to **Global Wood Source** are necessary until we find just the right stock.
5. Prototype the lifting mechanism. John will stop by Allen Steel next week to see what kinds of material are available. It may be necessary to have some metal parts fabricated, so we need to get moving on this.

With the planning done and the walnut stock selected for next week's effort, it's time to call it a day. Somehow it does not seem right to close up the Shop without having made some sawdust, but it's time for lunch.

## Saturday, October 01, 2005

We start work on the base, this consists of three elements:

- The two sides, each: 1' 5 7/8" x 3" x 7 1/2"
- The front: 2' 8" x 3 x 3"

The side elements are so wide because we need to mount the wheels in the back without allowing them to rub against the inward curving sides of the pedestal.



The plan is to cut the walnut planks to rough size and glue them up to form three-inch-thick blanks. The planks are rough cut so we need to get them into shape before gluing. Work proceeds as follows:

1. Cut the eight-foot boards in half on the table saw to make them easier to handle.
2. Then we use the planer to smooth the top and bottom surfaces for gluing. One board had quite a twist, so it had to be run through several times to flatten it enough for gluing.
3. Now that the boards lay flat, we trim the edges with the table saw.
4. Pick the boards with the best grain for the top layer and stack them up.

At this point work comes to a stop. We have been concerned about the difference in the color of the four boards (photograph to right). According to some woodworking articles a stain will even out the color. But it would be terrible to build the base and discover that the color of the sides doesn't match.

We decided to do a test and skip gluing up the boards until we know that the finish will work as advertised.



We break for lunch and stop at the supply store on the way back. We get some dark walnut stain and apply it to the edges. It will take several treatments before we decide whether it is good enough or we will need to take a different fabrication approach.

We also take time reviewing how to construct the mechanism for raising and lowering the top. A visit to Allen Steel during the week did not turn up any new ideas so we are going to have to fabricate something.

We decide to stick with the original design but change the materials. The risers will be brass so that it has a more finished look. The guides will be built from ultra-high-molecular-weight polyethylene bolted to an aluminum substrate.

This is something we want to prototype before too long. We'll finish the additional fabrication drawings tonight, buy the aluminum and brass from Allen Steel during the week and get a sample of the plastic someplace. If we are lucky we can build the prototype next week as well as decide how to proceed with fabricating the base.

## Saturday, October 8, 2005

The walnut-staining experiment is complete. During the week Charlie has been putting on additional coats of stain and doing a few experiments to see how close he can get the color to match. Bottom line, with lots of care he can get the colors very close, but the slight difference combined with the difference in texture between the boards yields an unacceptable result. We will have to find a different way to fabricate the base.

The solution we settle upon is to build a solid substrate for the base out of plywood and veneer it with walnut. Because the base is likely to get kicked, it needs to be a thick veneer. We decide to make it 1/4-inch by re-sawing the walnut planks ourselves.

We build the plywood substrate by gluing together four pieces of 3/4-inch material. Once the glue is set we will run it through the planer to get it to the correct thickness.

We cut the plywood needed for both sides and the front, then glue it up.



To create the 1/4-inch walnut veneer we need to use the band saw to re-saw the planks. However, the band saw has undergone a recent upgrade and needs some additional assembly and careful alignment. Fortunately, that does not take long. The test on scrap wood goes well so we are ready.

Alas, it has gotten late; plus we are concerned that if we cut the walnut into 1/4-inch planks it might warp while waiting for us to finish the substrate. So we must leave that for another day.

## Saturday, October 15, 2005

Big fun today – we start working with the walnut. We know that doing the quarter-inch walnut veneer is going to be hard! Lots of edges have to match perfectly. So we start with something simple: the bottom.

We select some ordinary walnut as this will not be seen. You might ask, “Why put walnut on the bottom at all?” There are a few reasons but, primarily, we want good hardwood to be on the floor, not the soft plywood that can get easily damaged. Visually, it does not make a lot of difference except when you tilt up the pulpit for movement. Additionally, it gives us a safe place to start the learning curve.

With the walnut plank selected we re-saw the board using the band saw. Raw, the board is 3' x 6" x 3/4" and we need to cut this down so that we have two boards of 3' x 6" x 3/8". The band saw blade is very thin with a narrow kerf so we don't lose a lot of wood in the cutting process. We just have to be careful to keep the cut straight.

The cut goes well so we clean up the boards with the planer: nice and flat and smooth. Making sawdust is fun, but also scary! The dust from the band saw is very fine, it turns our facemasks/filters a deep red-brown. We resolve to rig a better dust/chip collection vacuum next time and ALWAYS use our masks.

With the wood ready, it's time to start fitting and cutting. Because the front of the base is not as wide as the sides, we have a complex cut to make and it has to fit just right. Well, at least fit just right on the top where it will be visible. The bottom is a practice run.

We lay out the wood and mark the cuts. After some deliberation, we decide to make the cuts by hand using the band saw and then sanding as needed to get a good fit. It works, kind of. It's not quite as tight as we would like but this was intended to be a practice run.

Life in the Shop is good.

Despite all of the verbiage describing the process, the work went rather quickly. There is daylight yet to burn so we tackle upgrading the router table. We will be using this to cut most of the 45° angles needed for the base.



## Saturday, November 5, 2005

Having secured the parts to upgrade the router table, we tackle that first. It goes well and we start planning how to make the highly-visible top and sides of the base. The trick is to find a sequence of operations that allows for the easiest incremental assembly.

First, we select the boards that look the best. These will be very visible on the front and top of the base. We prepared a cutting plan to insure we will get all the pieces we need with the grains and patterns matching at each of the critical edges. This took more time

than expected but it pays to be careful. Working on the bottom was practice, this is for real and any **oops** will be visible.

Now its time to make sawdust. It's off to the band saw, again we need to make veneer out of planks. This time we duct-tape the hose from the Shop vacuum to the bottom of the band saw to try and collect as much dust as we can.

The sawing goes well and the vacuum system makes a noticeable difference. Next we use the planer to get the boards smooth and of a uniform size. Uniform size is critical as all the edges have to meet at 45° angles, a difference in thickness can make this extremely awkward.

We have been using duct tape and the Shop vacuum for gathering the chips and dust but this time we try a new attachment that came with the tool.

**OOPS!** While the new approach captures all the chips, it vents much more fine dust than with the Shop vacuum. Fortunately we were using the face masks / filters again, but the dust is becoming a problem. It's bad enough to have to wear a mask when using a tool, but the dust gets on everything and kicks up again as you move around the shop.

The face masks are so uncomfortable and hot that we can't bear to wear them all the time. We need to think about better dust control as we move forward and there's no time like the present. It's getting late so we don't want to start doing the fine joinery needed for the edges right now anyway.

As we talk about dust collection, we are reminded of how quickly the fine paper filter in the Shop vacuum gets clogged and how nasty it is to take out and clean. If collecting the dust is an issue, what about just removing it? What if we remove the paper filter and put a long exhaust hose on the Shop vacuum? The vacuum will pull the dust and chips into the Shop vacuum then vent the fine dust out the exhaust hose. If we put the exhaust hose outside and upwind, this should work well.

We have a plan! During the week we will get some parts and see if we can put it all together next week. We need some large diameter exhaust hose, some hard plastic fittings and duct tape. Yes we will definitely need more duct tape.

Life in the Shop is good!

## **Saturday, November 12, 2005**

We continue putting the 1/4" walnut veneer on the base. Because we get exactly one shot at doing this correctly, we are only doing a few pieces at a time. Today it's the front and the inside back.

We need to book-match the boards to be used for the front and top so that the grain lines up and the color matches. After much deliberation, we decide exactly which board to use for each surface and which part of each board is to be used. Now that we have a cutting plan, we mark all the cuts and matching edges with masking tape so there is no ambiguity.



We are almost ready to make sawdust but, naturally, there is some setup work first:

1. Adjust the table saw blade to a 45° angle and make some test cuts. This has to be dead on!
2. Cut 45° angles into two alignment boards.
3. Clamp the alignment boards into place.
4. Get the glue and the applicator ready.
5. Set out and adjust the clamps for glue up.
6. Cut some backing boards. The ¼” walnut veneer flexes more than expected. To make sure we get a solid glue joint, we need to use ¾” plywood backing boards to insure even pressure across the walnut.

Now we cut the walnut front! We rough cut it one-inch-long and slowly work it down to the exact fit. It takes about a dozen passes at the table saw. As we get closer to the fit, we take off less and less, down to less than 1/64” with each pass. It’s slow going.



We use the same approach for cutting the inside-back veneer. That, too, takes awhile.

When the cutting is done and we are comfortable with the fit, it’s time to glue and clamp.

There’s not much more we can do until the glue is set. So we clean up the shop and make a quick shopping list of parts we need for an improved sawdust-removal system and we are done. Good thing we are done early, I have to do sound tonight for Jeanne and Nita’s “Celebration of Love,” – there’s setup, training, and sound check to be done so I need to get there early.

## Saturday, December 17, 2005

The holiday season is full of activities: wreath making with Grace Murata, caroling with the choir, shopping, and baking. We have only managed one short woodworking session.

We are down to the fine work of putting the quarter-inch walnut veneer on the top front of the base. As with the other work, it is a long slow process of making finer and finer cuts as we “sneak up” on the perfect cut so that the 45° angle at the corner is perfect.

Then its time to glue and clamp the piece. We have been using a fancy new glue-spreading roller that Charlie bought, but it has been putting down such a thin layer of glue that we don't have much working time. So this time we go back to the traditional technique of spreading the glue with a scrap of wood.

**OOPS!** This yielded too much glue and a huge amount squeezed out when we clamped the board in place. So it's back to the roller for the next effort, we just need to figure out a way to get a slightly thicker coat using this technique. Life is for learning.

*2005 draws to a close for the Pulpit*

# The Narrative



2006

## Saturday, January 14, 2006

The holiday season is (finally) over and the houseguests have (finally) gone; at long last life can return to “normal” and we can get back to the Shop. At this point we have applied ten pieces of the quarter-inch walnut veneer to the base and have four left to apply. Naturally, these will be the most difficult:

1. Right and Left Top Sides – Hard because they have a 45° angle cut that mends in a right-angle cut in the middle of the board. Plus, there will be a very visible seam where the side meets the front board. The back also needs to be at a 45° angle to hide the end grain.
2. Right and Left Backs – Hard because they must fit exactly with three other pieces, all with a 45° angle to hide end grain.

We start with the two top pieces. Making the two cuts to fit around the top front board are scaring us big time. We used a band saw when making the corresponding pieces for the bottom but this did not give us as tight a joint as we want for the top. Another approach is needed.

We decide to try a new technique and use a **NEW TOOL!** Well, actually it's a tool that Charlie has had for awhile but has never used. At the last tool show he upgraded his table router with micro-adjustable fence and height adjustments – it's very cool. For its first trial run we will use it with a flush-cut bit to trace a template.

The template is made from two pieces of scrap hard board. One is cut at a 45° angle to match the side edge of the top front veneer and another cut at a 90° angle to match the back of the top front. We put these on the base and line them up exactly, then tape them together to form a perfect cutting template. The next picture shows the template on top of the table router.



We line up the grain on the veneer to be cut so that it matches what is already on the base and use the template to draw a cutting line on the wood. Using the band saw to make a rough cut, we leave about an eighth-inch of wood away from the cutting line.

We adhere the template to the walnut with double-sided carpet tape using the cutting line for alignment.

Then, with the table router, we make the cut by running the veneer against a flat trip bit with its guide bar running against the edge of the template. This gives us a cut that matches the template. Well, almost; it's actually a little bit rounded where the 45° angle meets the 90° angle because the router bit spins when it cuts. This is easily fixed with sandpaper – one of the few occasions when a hand tool is better than a power tool (but we did think about using a power tool).

Using this technique, we quickly cut both of the top side pieces. We can't glue them up, though, because the end grain on the back of the base is exposed. The veneer from the top, inside, and outside, have all had their edges beveled at a 45° angle so that we can make an end piece that will fit and hide the end grain. But this means that everything has to line up perfectly and it is too late in the day to start another tricky task.

## Saturday, January 21, 2006

Charlie has been cogitating upon the difficulties of cutting the end pieces. The task of beveling the edges is hard enough, but in this case it is complicated by the fact that the base is not quite square (yes, not being square is an **OOPS**, but that was covered above and I just don't want to go over it again – its too depressing - we really should have a bigger table saw). However, not to worry, Charlie has found a solution based upon using the table router:

1. Take some hard board and cut it to the approximate size of the right back.
2. Clamp the board to the back of the base and use a hand-held router with a straight cut-off bit to cut it to the *exact* size and shape of the base.
3. Align the grain of the veneer for the back, then adhere the template using double sided carpet tape.
4. Put a 45° edging bit with a roller-bearing guide in the table router.
5. Adjust the height so that it cuts a perfect bevel in the veneer.
6. Just do it!

To be honest, we practice with some scrap



veneer to make sure it will all work correctly. It takes us two hours to cut the first template and adjust the height of the router bit (micro-adjustable is wonderful). By now it's late afternoon and we both have life-maintenance tasks that need to be done so it's time to stop.

All in all it was a good day. We solved a hard problem by creating some templates and verified that they will work. Life in the Shop is good – it feels like flying!

## Sunday, January 22, 2006

We can't stand it! We had such success Saturday that after services we decide to cut the two back pieces. This is a little unnerving because it has to be just right but it actually goes very quickly and they fit perfectly.

Next we have to cut the top side pieces to length and bevel their back edges. We are feeling good but decide to exercise discretion and leave this task until next week.

Time to clean up the Shop and then watch the end of the NFL playoffs.

We have two more cuts to make and then we can glue up the last four boards on the base. With the completion of the base so near, we have started turning our thoughts to cutting the walnut rails that edge the corners of the pedestal. Life in the Shop is just fine!

## Sunday, January 29, 2006

Glue up time – first we did the top left (you can never have too many clamps):



We are on a roll, we break for lunch to let the glue set. We repeat the process to glue up the right top. It all goes very nicely and we are done in short order.

As we clean up the Shop, we continue our discussions of what comes next. We still have to put the end boards on the back of the base. But after that it seems like we should return to working the curved sides. These have to be cut to size so they can be used to guide the cutting of the front and edge pieces.

Here is real food for thought: how to cut two large pieces of curved wood accurately? There are only two of them, so we can make no mistakes!

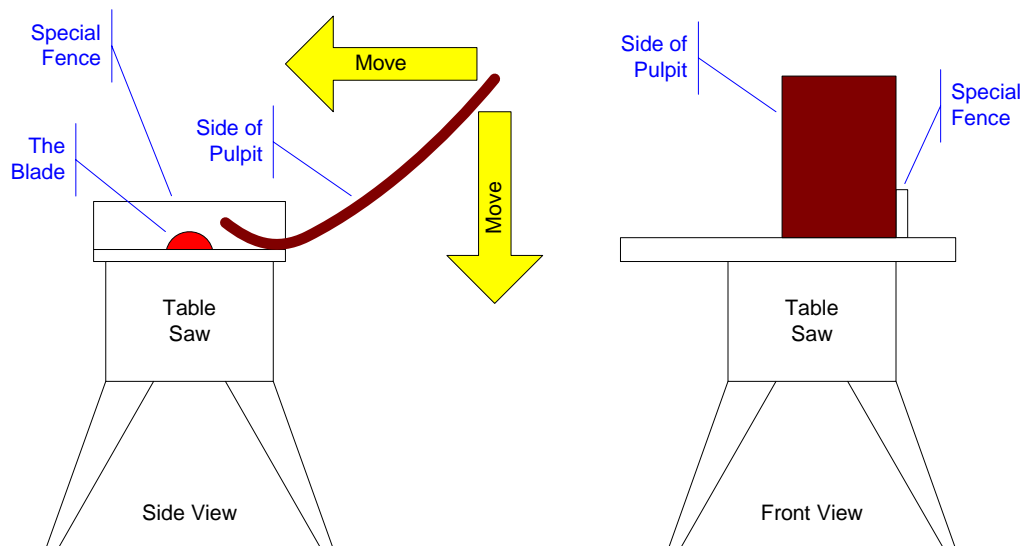


## Saturday, February 4, 2006

The goal for today is to cut the curved sides to width! We have been thinking about this all week and start the day with a discussion about how to approach the problem. We decide that the best approach is to use the table saw with an extension on the rip fence.

There are two main concerns with the cut (see figures below).

1. Keeping the curved surface of the board in contact with the top of the table saw at the point where the blade comes up. This means that the wood must be moved in two directions at once: forward into the blade and down as we move through the curved surface.
2. Keeping the edge against the fence so that the width is correct for the length of the cut.



Here is how we did it:

- Cal stands on the feed side of the table saw. He will support the wood at the start of the cut and guide the wood into the blade.
- I stand on the side of the table with pushers. My job is to keep the edge of the wood pushed against the fence and the width of the wood flat on the bed of the table saw. Because the wood is curved, it is possible for it to move above the blade and not get cut, so I must communicate what adjustments are needed as we make the cut.
- Charlie receives the wood and keeps it moving through the end of the cut.

This is among the hardest cuts we have to make. If we mess up the wood, we need to build a whole new laminated side – this would NOT be good!

In reality we need to make four cuts in all, two for each board:



1. Square up one edge.
2. Cut to width.

The boards are wider than we need so we can make several attempts at the first cut. The second cut, though, we get one shot at! We will square up both boards first and then set the fence to the final width and make the second (scary) cut.

With the blade recessed, we practice making the cut. It takes about five attempts to work out our body positions, footing, hand placement, weight transfers and communication: like choreography with the addition of a sharp spinning object – the table-saw blade.

At last we feel we are ready and it's time to raise the blade and crank up the motor. We have to force ourselves to relax, and away we go. The first cut on the first board goes well on the first pass. It's done, we are stoked!

The first cut on the second board is not quite as smooth. We get a little wobble resulting in a “nick” in the side – the Universe has humbled us! But this is the first cut, so we do it again with better results.

Now it gets really scary – we have one shot at the second cut for each board and we are two for three. Set the fence, take a deep breath, relax, do it. First board, goes fine! Second board, goes fine.

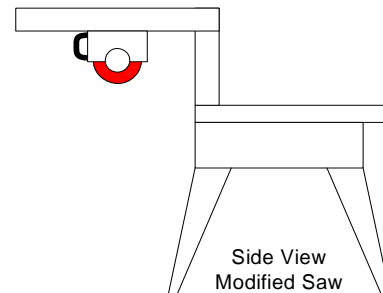
Life in the Shop is good!

Time to clean up and call it a day while we are ahead. Next week, cutting the bottoms of the sides. That will be difficult, as we are cutting a curved surface at an angle. We had proposed a solution back in September, but it is time for reflection.

## Saturday, February 11, 2006

Charlie has thought of a better way to approach cutting the bottoms than we had in September. We talk it through, make a few adjustments and agree on the solution.

- Invert the top of the bending jig so that the ribs are sticking up.
- Clamp the curved wood to the frame so that it is stable.
- Make some modifications to the radial-arm saw so that the blade can be pulled across the wood when clamped to the jig. This requires:
  - Removing the wheels to lower the over-all height and increase stability.
  - Re-mounting the arm so that it extends off the back of the saw stand.



Now we have a plan but we have never used this saw before. Charlie bought it used from a friend so, before we start with the modifications, we have to do some maintenance.

We break it down, clean and lubricate all the moving parts, and install a shelf for stability and storage (there's never enough storage in a shop).

So we become mechanics for the rest of the day as well as few evenings after work.

## Sunday, February 25, 2006

All is ready, we move the modified radial-arm saw up against the bending jig and start the alignment process. Alignment is a little tricky as we have several degrees of movement that must be accounted for:

1. The cut line of the saw must be relative to the wood.
2. The angle of the blade must be perpendicular to the floor.
3. The travel of the blade must cut across the entire width of the wood.



**OOPS!** Despite all of our measurements and calculations, once the saw is actually in place, the travel of the blade is not quite long enough to make the complete cut. We have to compensate for this by “lowering” the blade into the wood and pulling the blade through the material.

Time to cut. It takes all three of us:

- Cal steadies the wood and watches to make sure that the cut is complete
- I lower the blade into the wood at the beginning and raise it again when the cut is complete.
- Charlie handles the power switch and pulls the blade through the wood.

Since we are cutting the curved laminated sides, these are critical cuts. We only get one shot and it has to be correct. We make several practice passes using a calibration blade.

Then we switch to the cutting blade and make some additional practice passes. Finally we're ready to do it.

We take a moment to relax and then turn on the motor!



Both cuts go smoothly - life in the Shop is good!

This work went quickly so we do some clean up and then talk about how to make the cuts at the top of the sides. These are very hard cuts, too, because they are compound angles across a changing rate of curvature. We mark out where the cuts will have to be made on each side.

The initial plan is to use the modified radial-arm saw as we did for cutting the bottoms of the two sides. But there is not enough travel in the blade, plus we are concerned about getting both sides to match exactly. Food for thought until we meet again.

## Saturday, March 4, 2006

With both sides cut to width and the bottoms cut square, we are ready for a little dry assembly. We make two jigs:

1. We mount cleats on a sheet of plywood to mark where the outside edges of the pedestal will go relative to each other. This keeps the sides properly spaced and parallel.

2. We make a fixture that will fit into the narrow part of the pedestal to hold the sides the proper distance apart .

Once it is assembled, we really start to get a feel for the scale of the completed project. It looks very good. We are stoked – life in the Shop is GOOD!

But our enthusiasm is quickly dampened as we start to review our options for making the cuts at the top of the sides. We have no good solution. We put some extra energy into cleaning up the shop and leave contemplating how to make these critical cuts.

Life in the Shop is good, but not easy!

## Hiatus: March Through June

Life and employment have conspired to take up our weekends so we are unable to work on the pulpit for many months. Among the myriad of interruptions:

- Both Charlie and I had to work a lot of overtime to get a product ready for shipment. This went on for months. The product did ship, but at a huge personal cost.
- My father had a mild heart attack from which he fully recovered, but I spent a couple of weeks with him so he would not have to be alone in the hospital and to ensure he was fully situated upon returning home.
- Charlie's sister and niece both had major surgery within a few weeks of each other. The family needed him for several weeks to assist with recovery and life-maintenance tasks.
- Cal's job required travel that sent him off to India, Israel, England, and a variety of states.
- I fell down the stairs and shattered my left fibula and badly damaged my ankle. Two surgeries, physical therapy and lots of convalescence.
- The UUFRC Silent Auction and Blues at the Church Third Edition were both fun, but kept us out of the Shop.

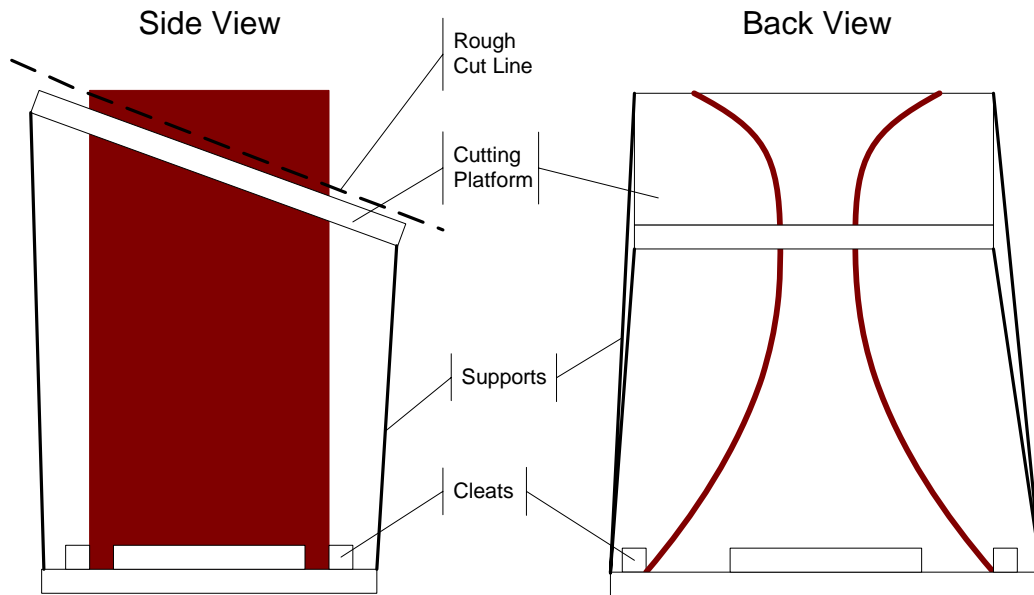
It is very frustrating being out of the Shop for such a long time.

## Sunday, July 8, 2006

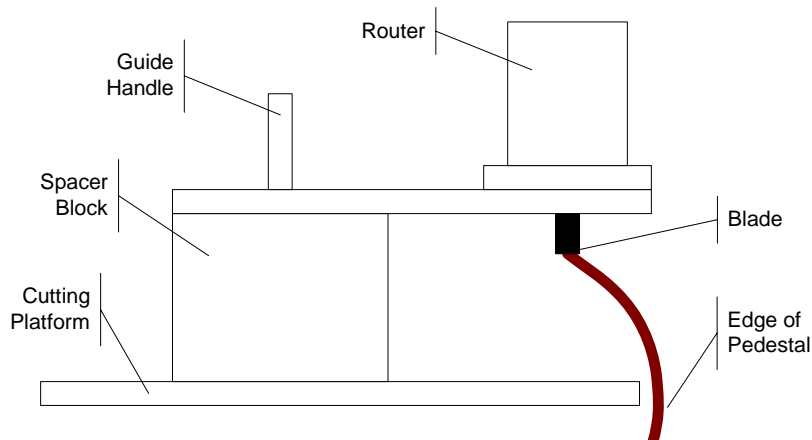
Everyone is in town and available to get together though I am still on crutches. This is to be a planning meeting. How to cut the tops of the two sides remains a mystery, though Charlie has hinted that he has a solution.

Charlie does have a solution! The proposal is to approach the problem like a milling machine – cut down from the top to the required depth. Since we don't have a milling machine we will use a router with plunge / edge cutting bit combined with a custom cutting platform. Here is how we will approach the problem:

1. Finish building and assembling the body of the pulpit (sides, front and trim) before cutting the top. Thus, when we cut the top, we will be cutting all of the elements at the same time to the same line.
2. Build a ridge-cutting platform that goes around the top of the pulpit at the exact level we want it cut. We will use the temporary base built on March 4 as a reference for the cutting platform and the pulpit body. This will keep everything aligned during cutting operations.



3. Using a reciprocating saw, we will rough cut the front and sides to within a quarter inch of the target line (i.e. the level of the cutting platform) .
4. A special base extension will be built for the router. It will allow the router bit to move above the rough-cut pulpit top while being supported on the cutting platform.



5. We will make multiple passes with the router, lowering the bit and adjusting the router base extension until we are level with the cutting platform.

This is very nice. It guarantees level edges all round the top of the pedestal.

Since this plan requires that the construction of the pedestal be complete, we need to move on:

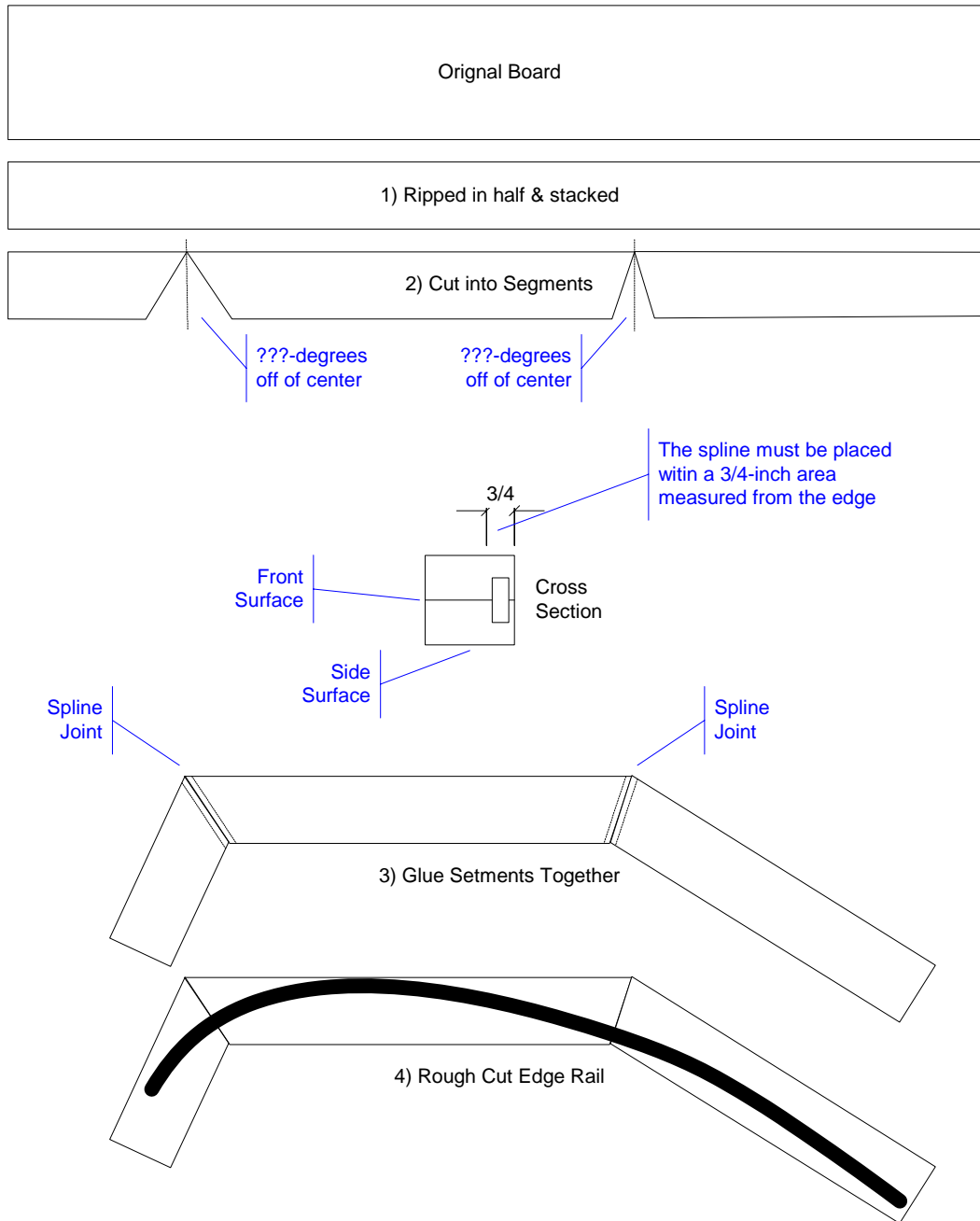
1. Construct the front and rear walnut edging for the two sides.
2. Build the front panel.

First we need to make some work space by returning the radial-arm saw to its original configuration and rolling it back into its storage corner. Then we invert the top of the laminate bending cabinet so we have another working surface. This does not take long and we are quickly back to working on the pedestal and that wonderful walnut!

Next we have to figure out how to cut the curved front and back edge rails from the boards. A cross section of the edge rail is 2"x 2" and the overall length is 43". However, to cut an edge rail from a single board, the board would have to be 2" x 11"x 43" and none of our walnut stock is this big (plus there would be a lot of waste). So we have to figure out how to work with the boards we have in order to make the edge rails. Too, we have to consider the consistency of the grain and the number of glue up seams that might show.

The boards we have are plenty long enough, the thickness and width are the problem. This is how we decide to do it (see figure below):

1. Rip and glue up a board that is at least eight inches wide (to allow for waste) and one-inch thick (not a problem) matching the edge grain. This will give us stock that is big enough.
2. Cut the long board into three segments.
3. Cut slots for a spline joint in angled edges.
4. Cut material for the spline center – **take care to align grain and color!**
5. Glue the segments together.
6. Rough cut to the shape of the edge rail.



Now that we have a plan for how to cut the edge rails, we need to pick the boards that we are actually going to use.

**OOPS!** When we first started this project, we reviewed all the walnut and set aside the pieces we wanted to use for the different parts. Unfortunately, our penciled markings were not specific enough so now we have to review our walnut selections again. This is actually a lot of work – both grain and color need to match. It takes awhile.



As we review the boards, we verify our cutting plans. This time we mark the selected boards with strips of blue tape containing very explicit notations as to which walnut board is being used for what part of the pulpit, such as front rail, back rail, or reader board.

We are done for the day, time for a very late lunch!

# Thursday, July 13, 2006

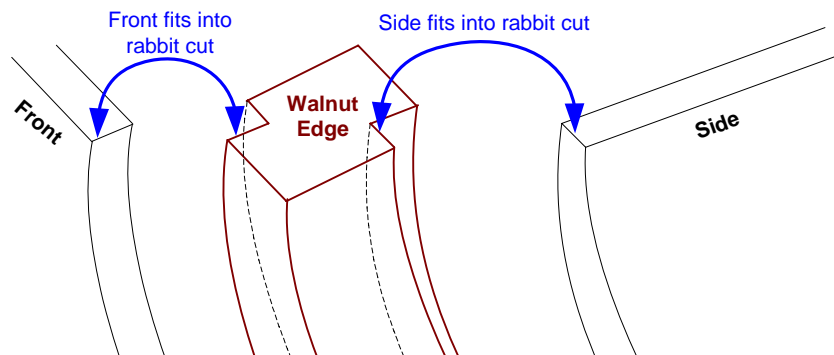
The advantage of being disabled (in my case) and unemployed (in Charlie's case), is that we can work on the Pulpit during the week. The goal is to create the templates needed to cut the edge rails by tracing the curve of the laminated side. We do this quickly and make a rough cut with the band saw.

The cut goes quickly and we start to lay out the materials so we can use the router with a flush cut bit to make the final cut.

**OOPS!** It is at this stage that we realize that we have *not fully thought out* all of the steps necessary to actually fabricate the edge rails and that we need to do this before going any further.

Out comes the paper and pencil. But just drawing pictures is not enough, we grab scrap wood to make a quick mockup to illustrate the relationships. This is hard work, cutting the edges is going to be a lot more involved than we thought. Our brains are starting to hurt, it's time to break for lunch!

With renewed energy, we return to paper and pencil and finish off the plan. The following figure shows the overall work to be done, though there are many more steps involved than are detailed below.

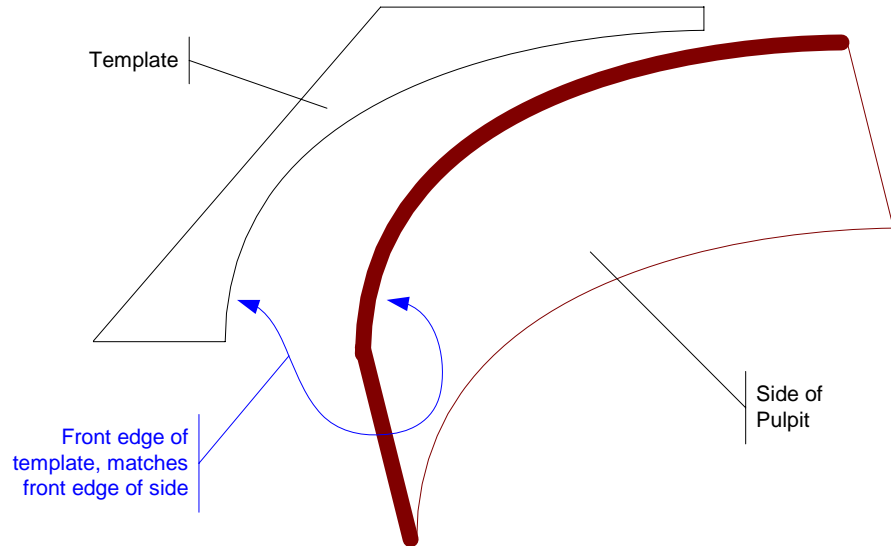


There are a lot of similar curves, but not exactly the same, so great care must be taken to ensure that things match up.

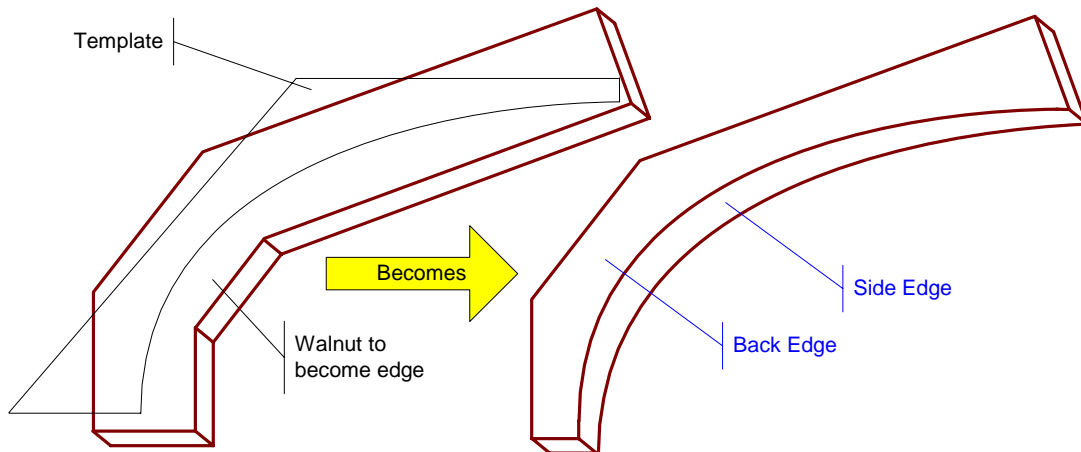
Here is how we propose to do it:

## The Sides

1. Using one of the finished sides, create a template that matches the outside curve. We do this by:
  - a. Tracing an a line on some quarter-inch pressboard we use for templates.
  - b. Using the band saw to cut within an eight-inch of the line.
  - c. Clamping the template to the side.
  - d. Using a flush-trim bit on the router to get an exact match of the curve.

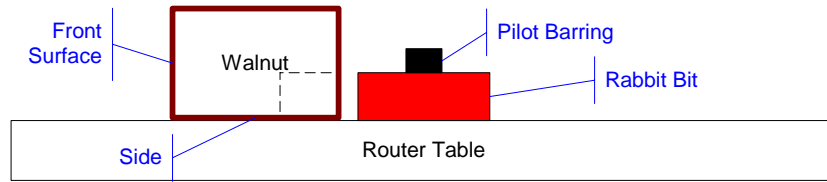


2. Take the template and lay it on one of the glued-up walnut pieces we designed on Saturday.
  - a. Trace the line from the template created above.
  - b. Use the band saw to cut to within an eight-inch of the line.
  - c. Use the router with a pilot bit to cut the walnut to an exact match of the template curve.



Note that the curved edge matches the outside curved surface of the side.

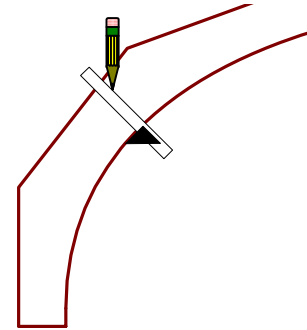
3. Cut the rabbit that the side will fit into. This will be done using the router table with a rabbit bit and a pilot bearing. Seen from the side the cut will look like:



The depth of the rabbit (relative to the side) will be a little deeper than necessary (controlled by the height of the rabbit blade above the table surface). This extra material will allow us to flush cut the walnut to an exact match with the side.

4. **For the two front edge rails** - Trim off the excess walnut from the back (opposite the rabbit). This is not a critical cut as this edge will be hidden from view. Rather than make an additional template, we will simply scribe a line and cut up to it with the band saw.

Scribing the line must be done with some care to make sure we don't remove too much wood. Using a pencil and a combination ruler will do the job.



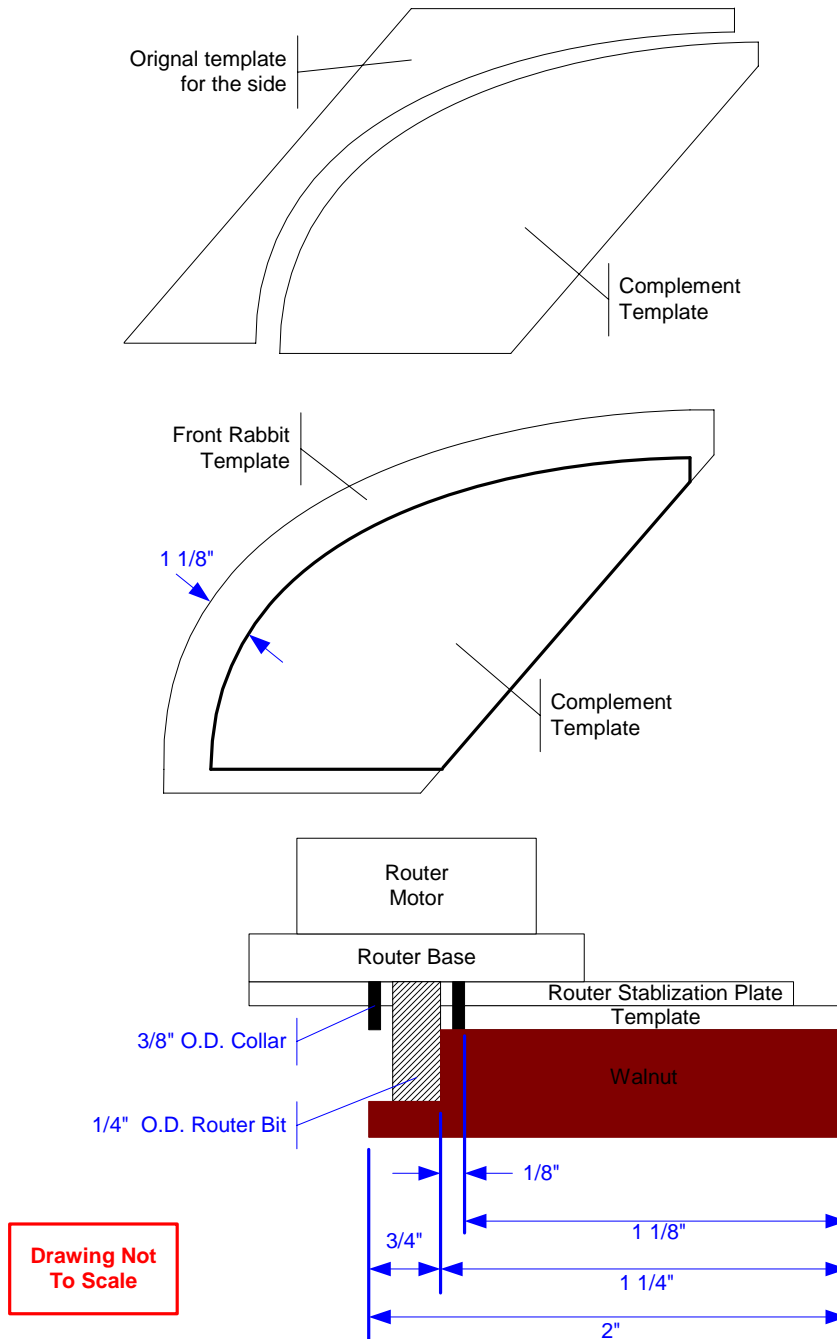
5. **For the two back edge rails** – Make a template for cutting the walnut to 1 ¼" width.
6. Glue the walnut to the side to provide additional strength to the walnut when we cut the rabbit for the front.
7. Flush cut the walnut to an exact match of the side. This will be done on the table router for stability.

## The Front

Two templates are needed, one for cutting the rabbit in the walnut edging where the front fits into the edging, and one for cutting the front. However, we need to know exactly how thick the front panel will be before we can cut the rabbit, so building the front panel is next.

8. Purchase the Quilted Maple plank from which the quarter-inch front veneer will be made. Also purchase the high-grade plywood to be used as the substrate for the front.
9. Re-saw the Quilted Maple plank to create the veneer. Care must be taken to keep the edges marked so that we get the correct "book matched" effect upon glue up.
10. Without gluing up the front, we need to make a very exact measurement of the thickness of the combined veneer and substrate so we can set the depth of the rabbit.
11. Make a template to guide the cutting of the rabbit for the front. This is tricky because we want the width of the walnut to be constant across its entire length.
  - a. Construct a template that is the complement of the template used to cut the side of the walnut (see picture below).

- b. Use the complement template to guide the router for cutting another template that will be used to cut the rabbit on the front .



**OOPS!** We are still figuring out how to cut a template that is exactly  $1 \frac{1}{4}$  inches larger than the other. None of the router collars we have are large enough to do this. The current “plan of record” is to construct a collar extension from some plastic. To get this exactly round and perfectly centered, we will have to make the extension using a lathe (Cal has one). We agree to revisit this issue once Cal is back from his business trip. With high hopes we carry on with the planning.

12. Attach the front rabbit template to the walnut and side sub-assembly using carpet tape. Care must be taken not to damage the walnut or the template (the same template gets used for doing each side). Use a hand router with guide collar to cut the rabbit for the front panel. Again, the cut will be a little deep so that later a flush cut bit can be used to get the walnut exactly even with the front panel.
13. In order to cut the front to match the walnut, we need a template that is the complement of the one used to cut the rabbit. As per above, we leave this as a simple exercise for the reader.
14. Using the new template, we:
  - a. Mark both sides of the plywood substrate (just the plywood, the veneer goes on later).
  - b. Use the band saw to cut to within one-eighth of an inch of the line.
  - c. Use the template, router and a flush cut bit to get the exact cut.
15. Do a dry assembly to make sure that we are really happy with everything. We don't want to proceed to working with the veneer for the front if we have any assembly problems.
16. Glue the veneer to the substrate, allowing the veneer to overhang the edge of the plywood substrate by at least an eighth of an inch. This is a **CRITICAL** step, this veneer is the most visible feature of the Pulpit and the book-matched seams must be exact and tight as an \_\_\_, (fill in the blank with appropriate shop term).
17. Once the glue on the veneer has fully set, trim it flush with the plywood substrate using a router.

## Finishing Up

The critical cutting and fitting is done, time to assemble the pedestal.

18. Glue the front panel to the two side sub-assemblies (the walnut is already glued to the sides).
19. Flush cut the walnut edges to the front panel veneer.
20. Run an eight-inch round-over bit on the leading edges of the walnut.

## Tuesday, July 25, 2006

We review my write up on how to proceed. Charlie and I spend two hours going through the process step-by-step but do not finish. That evening, I enter the corrections, clarifications and missing steps. A combination of extremely hot weather, job hunting and family responsibilities have kept us out of the Shop. Progress is slow, and hence a little disappointing.

## **Saturday, August 12, 2006**

Work proceeds on the walnut rails – but I have fallen down on the job of updating the Book of the Pulpit so I have to reconstruct events from memory.

We cut the walnut boards to size, run them through the router and glue them together. Once the glue is set, the stock will be ready for working.

## **Saturday, August 19, 2006**

We start making the templates for cutting the rails and quickly discover that this is going to be much more complex than we had thought. After some struggling, we agree that we will need to build a full prototype so we don't waste any of the good walnut with an error.

We continue working on the templates, figuring out how we will match the curve of the sides of the pedestal.

## **Saturday, September 2, 2006**

If we are going to build a prototype, we need to have some material, so it's off to do some shopping. A quick trip down to Woodcraft is in order where we buy some inexpensive hardwood to work with.

We spend the rest of the day planing and gluing the wood for the prototype and talking about how we are going to make all of the necessary cuts. This problem seems to be getting harder not simpler.

## **Saturdays, September 9 - 30, 2006**

We spend several weekends struggling with templates and techniques for making the rails. We keep hitting unexpected problems. It's so frustrating that I am not keeping very good notes.

## **Saturday, November 11, 2006**

Charlie had some repair work done on his house and the workmen left the Shop in a mess. We spend the day cleaning and reorganizing the Shop as well as doing some maintenance on the tools.

## **Saturday, November 18, 2006**

Now that we have the Shop back in order, we can review where we are with the prototype for the rails. The bottom line is that we need to try something different.

## **Saturday, December 2, 2006**

The end of the year is drawing nigh, and we don't really have a good solution for cutting the rails. We will have to expand our options, such as building our own router attachments to help us do the cutting.

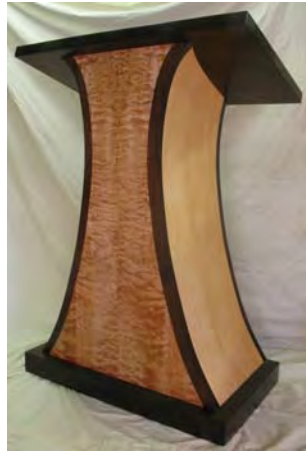
It's clear that our first attempt is not going to work, it has become our first prototype. We will have to start again in the new year making a second prototype.

*2006 Draws to a Close for the Pulpit*





# **The Narrative**



**2007**

## Saturday, March 17, 2007

It has been a long time since we really got any work done on the pulpit. Between my broken leg and major remodeling work on Charlie's house, there has been little opportunity to get into the Shop. But today – progress has been made!

Charlie was committed to other activities, so Cal and I did what we could on our own:

- We created a template that matches the back of the left side. There are two approaches to this:
  - The quick: Trace the back of the side; cut it on the band saw close to the line; rasp down to the line.
  - The extremely accurate: Make a positive template of the back curve; transfer that with an offset to a second template; then cut the board.

Since we are still just working on a simple edge, we decided to take the quick approach. We learned a few lessons but it went well and was indeed quick.

- We discovered that to adjust the depth of cut into the sample edge wood, we need the template to be about  $\frac{3}{4}$ " thick. So we took the  $\frac{1}{4}$ " template we had just made, and carpet taped it to a  $\frac{1}{2}$ " sheet of press board. A quick trip to the band saw and out comes the router with a flush cut bit and away we go. Done in no time.
- Now we have a thick template that we carpet tape to the edge piece. Again, we use the router with the flush cut bit. Two passes, taking a little material each time, and we are done! It matches very nicely – *not* perfectly, but given that the back edge is not visible, it's close enough to glue and still provide the necessary strength.

## Saturday, March 24, 2007

Cal and I work on routing the rabbit in the edge for the front. We use the hand router rather than the table router.

**OOPS!** I won't go into any detail about how we proceeded because that approach does not work! We got a nice curve, but it does not match the curve of the side. We have removed enough wood from this prototype that it can't be used anymore. It's a total wash.

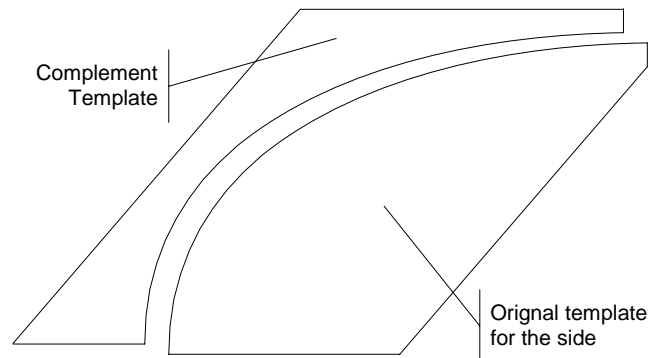
We will have to start a third prototype. We need to buy some more inexpensive hardwood, mill and glue up the stock and try it all again. .

## Saturday, May 19, 2007

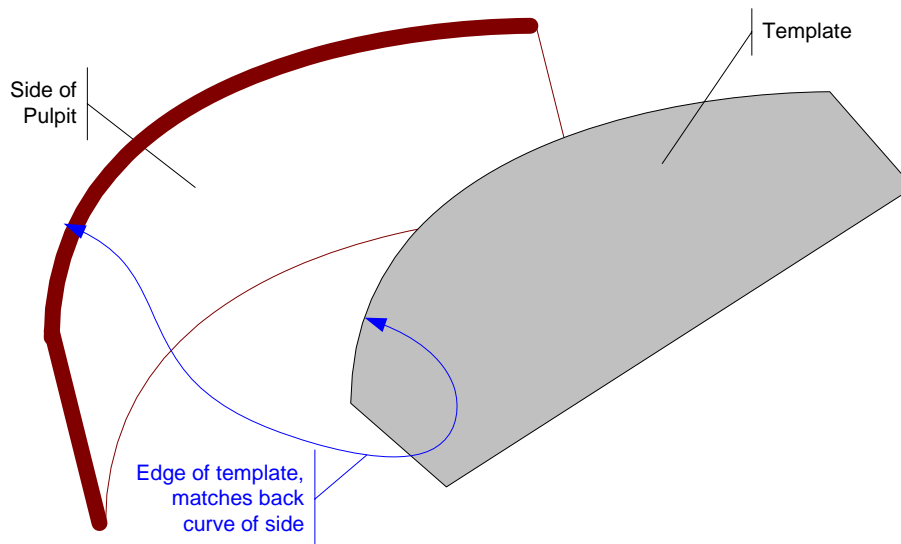
We need to recover from the failure of our second prototype. That approach clearly did not work. We decide to go and purchase some materials and talk about how to approach the problems that face us.

At Woodcraft, we pick up some poplar to use as the stock for the second template. It's a thick plank that we will have to cut in half, plane down, and glue up to match our walnut stock. Doing this is simple and mechanical, good "sawdust therapy" for the disheartened.

We glue up the stock and put it aside to cure. Then we look at the next task. We agree that one thing we need is better templates and the ability to make a matching complement template. We have struggled with this in the past and decide that we will just make a test set to see whether we can improve our skills.



All in all, it turns out to be easier than we had expected, the tricky part is cutting the initial template to match the curve of the side. The side is only about  $\frac{3}{4}$ " thick and we need to keep the template material stable while making the cut (router with flush cut bit and bearing on the bottom).

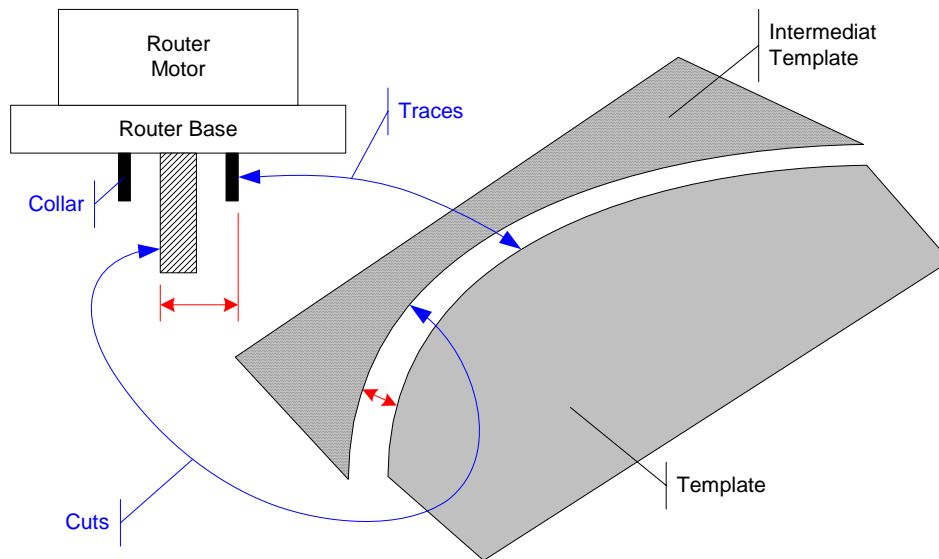


Charlie's carpet tape comes to the rescue, by putting a strip of this strong double-sided tape along the edge of the side we can keep it from moving in two dimensions. To keep it from flopping up and down, we set up the second side for support and use a couple of big Bessie clamps to keep the entire thing secure to our work surface (the casket we built for creating the curved sides).

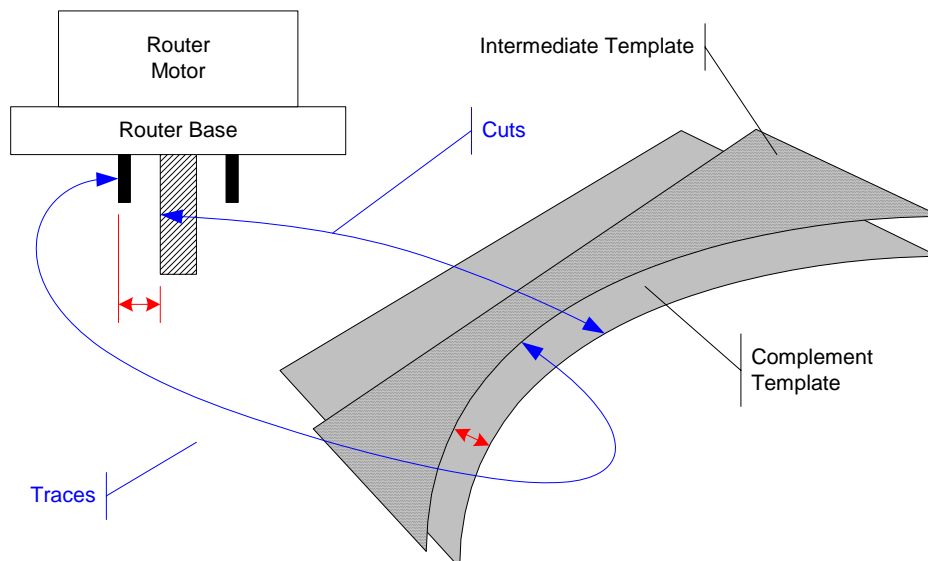
It all works and we have a nice template.

**OOPS!** We encounter a small problem when removing the template from the edge of the side. The tape is so strong that it tears out some of the template material. Yet another reminder from the Universe to go slow!

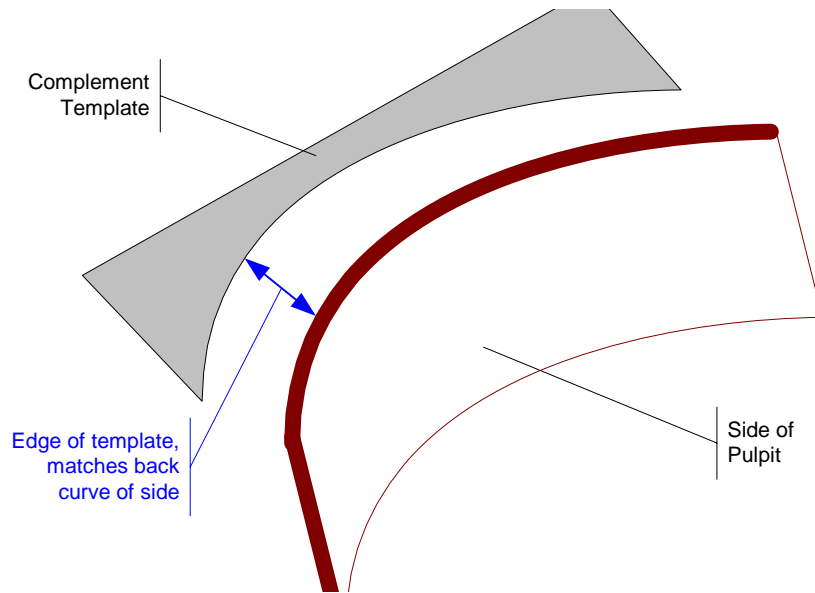
Now that we have an initial template, it's time to create its complement. Not hard but it takes several steps and two pieces of template material. First, an intermediate template is made that is larger by a constant amount from the original template. This is done using a collar mounted on the router and a straight cutting bit (no bearing on this bit).



Again, carpet tape is used to hold the original template to the intermediate stock while we make the cut. Then the intermediate template is flipped over and the final complement template is cut using the same router bit and collar.



The complement template can now be used with a straight cutting bit (with bearing on top) to cut a curve into the edge stock that matches exactly the shape of the back of side of the pulpit.

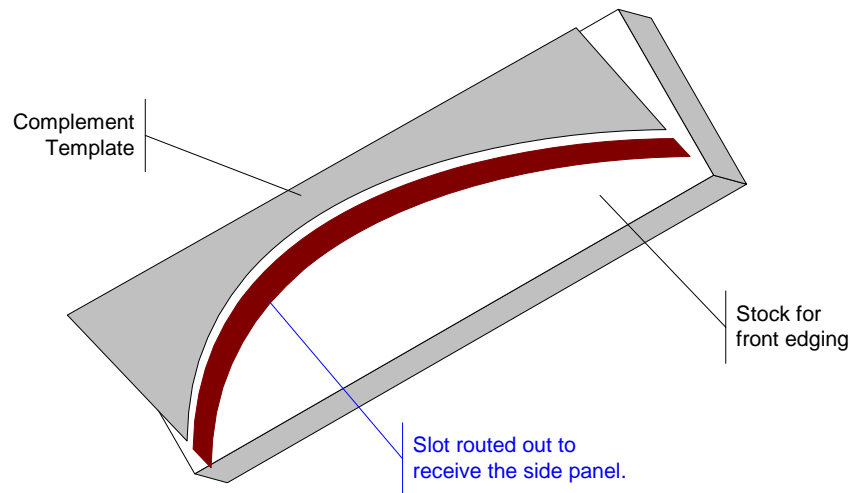


## Saturday, June 2, 2007

We feel like we are on a roll. Now we need to prepare the boards we glued up for the third prototype, we want them to be as close in size to the walnut stock as we can get them. First we plane them to width and then use the table saw to rip them to the correct width.

Next we cut the rabbit to receive the curved sides using the templates we made last time. When we started this task on the first prototype, we used the band saw to cut close to the final line. However, by removing that material, it was harder to keep the stock level. So this time we decide not to pre-cut the wood. There is a trade-off here, the router bit has to take out considerably more wood without pre-cutting, so we know that we need to go very, very slowly so the bit does not overheat. Our plan is to make lots of passes, lowering the bit each time until we get to the correct depth.

We take the template and clamp it to the stock, set up the router with a straight cutting bit (bearing on the top), and make the first pass. It goes well, even though we have to make more passes, the platform the router base rests on is much more secure. Skipping pre-cutting was definitely the way to go.



Life in the Shop is good – after routing the first channel to the template, we free-hand the removal of additional material until we have a slot in the prototype stock that is wider than the side (about  $\frac{3}{4}$ ”). We drop the side into the slot and it’s a perfect fit! We make a few alignment marks and then move on to the hard part.

The hard part is figuring out how to cut the rabbit for the front. Looking at the prototype stock with a slot routed into it and the edge fitting into the slot, a new approach presents itself:

1. Make a template that matches the curve of the visible part of the side (with the backing for the template going away from the visible part).
2. Dry assemble the side into the edge stock.
3. Put the template against the side and push everything into place. Clamp the template hard against the visible part of the side.
4. Use the router with a flush cut bit (bearing on the bottom) to trim the back of the template to match the edge of the stock exactly.
5. Use a shoulder-square to make alignment marks from the top of the trimmed template, down the edge of the template, and down the edge of the prototype stock.
6. Remove the template and the side from the prototype stock.
7. Move the template to the other side of the prototype stock and line it up with the edges that were trimmed to each other and the alignment marks. Clamp it into place.

Now the location of the curved edge of the template matches exactly where the visible edge of the side will be, but on the opposite side of the stock!



To cut the rabbit for the front, we need to use a router with a bit and collar such that the distance from the edge of the template to the cutting edge of the bit is 1 ¼". The problem is how to get a combination of bit and collar that will meet this requirement.

The only option is for Cal to turn a specialized router collar on his lathe. We will use a standard router collar as a foundation to ensure that Cal's collar is correctly centered.

Just to make sure, we take some template scraps and walk through the process. Yes, it appears that everything will work out fine.

**Amen, we have a plan!**

Time to clean up and get some lunch.

## **Saturday, June 9, 2007**

The three of us gather to move forward with our third prototype for the front rail. We start by making a template for cutting the rabbit for the front of the edging. There are several steps, but they are done quickly (practice is making us better at this):

1. Make a positive template that matches the curve for the visible surface of the side. This is done using the router with a flush-cutting bit with its guide bearing on the bottom.
2. Make a template that matches the one just made, but with the body of the template on the other side of the cut. This is a multi-step process requiring an intermediate transfer template:
  - a. Configure the router with a medium-sized collar and a small straight bit.
  - b. Clamp the template from above to the new template material.
  - c. Cut the transfer template with the router tracing with the collar.
  - d. Clamp the intermediate template to new template material.
  - e. Using the same router configuration (collar and bit), cut the final template.
3. The next task is to get everything aligned. We set the prototype on the bench and fit the side so that it is exactly right. We then take the template we just created and fit it snugly to the visible edge of the side. Fortunately, it's an exact fit because of the way we created the template.
4. We clamp the template to the prototype and use the router flush-cut bit (bearing on the bottom) to cut the back edge of the template to match the edge of the prototype exactly.
5. Next we use a shoulder-square to make alignment marks on both the template and down the entire edge of the prototype. These will be our alignment marks when we move the template to the other side of the prototype.

6. Because of the width of the collar extender that Cal made, we need the template to be thicker than  $\frac{1}{4}$ ", so we remove it from the prototype and screw it down to some  $\frac{3}{4}$ " pressboard stock. Back to the router but with a straight cutting bit with the bearing on top. We trace the template front and back so that the  $\frac{3}{4}$ " inch pressboard is an exact match.
7. Transfer the alignment marks from the original template down the side of the  $\frac{3}{4}$ " pressboard using the shoulder-square.
8. Flip the prototype stock over and attach the template (now 1" thick). Carefully we match the back edge and alignment marks *exactly*. This is a critical alignment, an error here will result in the  $1\frac{1}{4}$ " reveal of the edge rail to be off.

When clamped, the curved edge of the template maps out the curve of the visible side of the pulpit side when it is glued into place (on the other side of the prototype stock).

9. Cut the rabbit into which the front of the pulpit will fit using the router, this time configured with Cal's collar expander. Note that this is  $1\frac{1}{4}$ " wide from the edge of the curved side. Thus, the distance from the edge of the collar expander to the cutting edge of the router bit is  $1\frac{1}{4}$ ". We set up additional support surfaces so that the router will stay flat during the cut and away we go.

**OOPS!** The router vibration causes Cal's collar expander to fall off the router base and the router bit chews up the interior alignment hole! We had talked about using carpet tape to hold the collar in place but forgot. The expander is ruined and Cal will have to make another before we can proceed.

**We are bummed out!** This would have been the final cut to prove the process. We can see it coming together, but now we can't make the cut! Appropriate expletives are spoken, then we clean up and go to lunch.

## Saturday, June 16, 2007

During the week Cal made a new router collar expander, so we can return to the prototype to make the rabbit for the front to fit into. This time we set up the router using carpet tape to hold the collar expander into place and away we go. It works like a dream!

We take the time to rout out the additional material and hit a snag. The router bit is slipping and the cut is getting deeper and deeper. Not good, the bottom of the rabbit is our gluing surface for the front and we need a strong joint.

Our analysis is that the length of the straight cutting bit that we are using is too short. Thus, to get the depth of cut we need, we need more shank in the router chuck to hold it securely. We will have to purchase a longer straight cutting bit.

We break to eat lunch and purchase additional template material.

**OOPS!** The lumber yard in Belmont has moved or closed. Strike one! Off to Woodcraft for a visit with Eric McCrystal about our bit. Eric is on vacation -- strike two. But Woodcraft has the bit so we feel like we are making progress.

On to Home Depot to see if they have template material. The parking lot is a *total zoo* so we decide to skip this nonsense and go eat lunch.

## Saturday, June 23, 2007

Unitarian Universalist General Assembly in Portland, Oregon. No woodworking this weekend.

## Saturday, June 30, 2007

Charlie is out of town, so Cal and I finish the second prototype for the edging. Using the new longer router bit we cut the channel that will become the rabbit for the front. Again we have an issue with the bit coming loose, probably because we are in too much of a hurry. Going *much* slower and removing less wood with each pass of the router works better and keeps the bit secure.

We use the band saw to remove the extra wood. No problems here, using the big shop vacuum with a different nozzle to capture the sawdust works much better.

It looks good, time for a dry assembly and - it worked! At last we have proven a sequence of steps that can be used to produce an accurate rail for the leading edges.

Off to the store to get more template material. Next weekend we start working on the walnut!

## Saturday, July 28, 2007

Cal has been sick but is back on his feet, so we all return to the Shop for a little sawdust therapy. Having been successful with the third prototype, we move on to working toward cutting the walnut. Our first task is to make new templates.

Studying the diagrams on previous pages, we realized that the templates will be off by the diameter of the router bit. Hence, Cal makes new collars for the router, each different by the diameter of the flush-cut router bit (5/8"). Using these, we can now make a template that is an exact match:

1. Following the above sequence, cut the template material that matches the visible edge of the side. This is labeled "Inside Front B".
2. Create the intermediate template using one of Cal's new router collars.
3. Make the final template using the next larger new router collar.
4. A check and -- we have a match! But we really should have a better router bit.

As we have done this before the process went very quickly but the need for a new router bit prevents us from actually routing the walnut. The call of the wood is strong, though, after so much delay and being so close, we need to make some walnut sawdust. So we set up the table saw and square up the edges of both of the walnut boards that will be the stock for edging.

With vacations on the calendar we know that it will be several weeks before we are back in the Shop. We write up a shopping list: carpet tape and router bits, and then clean up. Then clean up again, making an extra effort to get everything ship-shape before our scheduled absences.

There is some discussion regarding getting things too clean being a violation of Shop ethics. But we carry on anyway and then make our regular pilgrimage to Jersey Joe's for a Cheese steak lunch. Life in the Shop is good and we have high expectations for our next get together and making the first router cuts on the final walnut rails.

## Saturday, August 18, 2007

Time to fish or cut bait! Now are the times that try men's souls; the tension is high: Today, we route the first walnut rail to form the complex edge that matches the curved sides for the pedestal. We have just enough walnut stock to make all the parts for the pulpit, no extra stock for re-dos. Plus, it's a hot day providing us with additional reasons to sweat.

We start out by making new templates, being very careful to label everything. Getting the correct template is a three-step process. We have been through this before, though, we know what to do and we get it done quickly – life in the Shop is good!



Then we lay out the cut on the walnut and attach the template using carpet tape, frequently using the third prototype as a reference. Next we set up lots of boards to ensure that the router stays level while cutting against the template. Charlie sets up the router and all three of us check everything twice. Time to cut walnut!

One of the big issues is keeping the router level while we cut. We have to build up so many layers that it's hard to see the actual walnut being cut.



All goes well, we finish routing the channel for the side to fit into. A trial fit shows that the cut is good. Life in the Shop is good, time for lunch. Next week we'll cut the slot on the other side where the front will fit, matching the curve of the side.

## Saturday, August 25, 2007

We have the process of making templates down now. This time we make one for the front visible edge of side "B". We whip this out, and zip through the three-step process of making the inverse template. Now it's time to rout walnut again.

We use the same process as last week: Build up many layers to insure that the router stays flat while making the cut. Then use the band saw to remove the first part of the extra walnut. Now for a dry fit. Everything goes together well – life in the Shop is good!

**OOPS!** With the side fitted into the walnut, we can see that something is wrong. The walnut has the correct curve, but it does not come all the way down to the bottom of the curved laminated side (multiple expletives in multiple languages from multiple people respectfully deleted).

Yes, there is a gap at the bottom but Charlie says he knows how to patch it, and given that we don't have enough wood to do it again, this is the approach that we will have to take. Thank goodness for Charlie's craftsmanship – it bails us out once again.

We all agree that we have made good progress, but we are a little bummed because of our error. Time for lunch and some beer – we have to figure out how to avoid the same mistake on the next edging.

## Saturday, September 08, 2007

Respectful of last weeks OOPS – we get right to work on the second of the two front walnut edgings. First step is create the template to guide the routing for the rabbit in the second side (side “A” on the labeling for the working parts).

We are experienced template-makers, having suffered / practiced through two prototypes and the first of the walnut edges. So it’s turn the crank time and we just march through the process:

1. Cut template Part 1 to match the front inside edge of Side A.
2. Use the first of Cal’s custom-made router collars to create the intermediate template (number 2) from the first template.
3. Working from template number 2, we use the next of Cal’s custom-made router collars to cut the third and final template.

Done – and the final template is a perfect match. We do good work! Life in the Shop is good.

Now, we want to lay the template out on the walnut blank to make sure we don’t repeat our error from the previous edging. Time to go very, very slow. Naturally, there are additional complications: the walnut has some imperfections and we want to make the cuts to minimize the knots and dings that might show on the finished piece.

We spend a good half-hour trying alternatives, double-checking, measuring, comparing to the prototype. Finally, we feel we have made the correct selections and template placement. We set up the router and the stabilizing platforms, say a few silent prayers to the Shop Gods, and start routing.

The first of the cuts in the second walnut edge are done! Dry assembly shows that everything is coming together and that we have indeed avoided the knots in the wood.

It’s 2:30pm, a long morning but successful. Next week we make the matching curve in the front of the trim. Time for lunch! Life in the Shop is good!

## Saturday, September 15, 2007

We’ve got this process down. Walk into the shop and go right to work. Make a new set of templates for “Side A front-edge outside visible”. Cut the alignment steps, then rout a channel in the walnut. Again it took us most of the day: 10:30am to 3:00pm but we got it done with **NO OOPS!**

Oh man, it is so sweet. Finishing the routing of the side and front rabbits in the second of the front walnut edges is a major milestone. All agree that there is still lots of work to be done, but we can see the light at the end of the tunnel. Life in the Shop is good!

## Saturday, September 22, 2007

Today we start working on the walnut edging for the back edges of the curved sides. That is to say it's a planning day. We talk out two approaches and settle on using biscuits to support a butt joint. This also has the advantage of letting us use yet another power tool, the Plate Joiner

(<http://woodworking.about.com/od/toolsequipment/p/plateJoiner.htm>).



The Plate Joiner is used to cut slots that the biscuits (small ovals of wood) fit into. The biscuit spans the joint providing strength and alignment across the joint. Not as much help with alignment with the joint, the curve of the biscuits allow some slop.



The Shop can be a harsh master, and we have learned a few lessons – so we go out and get some scrap stock to build a prototype. The process we work out goes something like the following:

1. Align the back edge of the side along the rail stock, making sure to miss any imperfections in the wood, then trace the outline of the side.
2. The front and back edges of the curved sides are close enough that we can reuse the templates made to cut the front edges. The template for the curve on the inside of the side piece is placed snugly against the side aligned on the rail and screwed to the stock. This gives us alignment across the width of the board.
3. Mark both the template and the side, one mark for each biscuit used to reinforce the joint.
4. Remove the side from the stock with its template attached.
5. Cut the slots for the biscuit with the Plate Joiner. The joiner tool is pressed up against the template for the one alignment, and the indexing mark we made on the template (corresponding to marks on the side) is used for alignment in the other direction. Whirr, whirr, whirr and the slots are all cut into the edge stock.



6. Remove the template from the edge stock and align it with the back edge of the side, matching up the index marks in step 3. The template needs to sit a little above the edge of the side.
7. Back to the Plate Joiner! As in step 5, the joiner is pushed up against the template edge for alignment in one direction and the index marks are used for the alignment in the other direction. Whirr, whirr, whirr and the slots are all cut into the edge of the side.
8. Cut off the extra wood with the band saw using the lines drawn in the first step. We make sure that we leave at least ¼” extra along the back of the trim.

Because we used the same template and index marks for both sets of cuts, the slots for the biscuits match up exactly. So we put glue on the biscuit and the matching edges of the side and clamp the trim to the side.

Note that this is only the first of many “assembly” steps. It is important that both sides be done at the same time so that the glue on both edges can set over the following week. Once the glue has cured then the work on the edges can continue.

9. Using a flush-trim router bit with the bearing on the bottom, we trim the walnut edging to be co-planer with the visible part of the curved side.

The critical issue here is keeping the router base perpendicular to the face of the side so that the flush-trim bit stays co-planer. To do this we need to set up the other curved side as a support for the router base.

10. Make the same flush-cut trim on the second side.
11. Cut the inside edge of the trim. This is complicated by the design requirement that the edging be ¼’ wider than the side itself. This means that we need a flush-cut bit with a bottom bearing with a ¼”-larger radius than the bit. We are not sure about this, Cal may have to fabricate another tool for us.
12. Using the flush-cut router bit with the extended bottom bearing, and using the other side to stabilize the router, we make the trim cut on the inside of the sides.

Simple – just a few steps and two weekends. Life in the Shop is good!

## **Saturday, October 6, 2007**

Time to see if the plan will work. We start on the back rails.

## **Saturday, October 13, 2007**

More work on the first back rails. We cut the biscuits and everything goes very nicely.

## Saturday, November 10, 2007

Lots of UUFRC activities and Thanksgiving vacations have delayed, once again, our work. But we are on a roll with the first side of the rear edging having gone so well. We buckle down and repeat the process to produce the second rear walnut banding.

Life in the Shop is good.

## Saturday, November 17, 2007

We finish work on the second rear walnut edge rail. Our process just works and we get it done quickly.

The next step is some assembly: gluing the rear walnut rails to the sides. Assembly *must* be done carefully so we will put that off until the next session when we have a full morning to do a dry run. Then we will apply the glue and do it for real.

Life in the Shop is good.

## Saturday, November 24, 2007

I can't make it to the shop this weekend, but we are on a roll so Cal and Charlie tackle the job of gluing up the rear walnut rails. It goes very well!





Life in the shop is VERY, VERY GOOD!

## Saturday, December 8, 2007

Having finished assembling both rear walnut rails, it time to focus on the front again. What is needed is a template for the front panel that will fit between the two sides. We are now quite good at making templates, what makes this hard is that we need to get both sides correctly aligned.

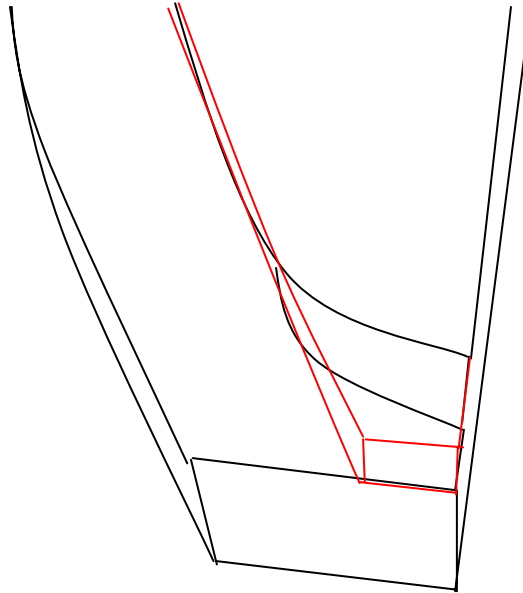
The approach we agree upon is to create a template for each side independently and then connect them with a third piece. This will give us lots of latitude for adjustment. First step is to make templates that will match the curve for the front. We are short on template material, so we make a quick run to the store then get down to work. It all goes rather quickly for the first side.

**OOPS!** As soon as we take up the second side we quickly rediscover the problem that we had cutting the front walnut rail. We didn't correctly account for the full width of the curved wood and, hence, the board is short at one corner. We need to address this before a template can be made. A patch is needed to extend that one small corner.

Because of all the curves, it's hard to visualize the patch that is needed and, unfortunately, we didn't take before and after pictures. The following drawing is my best attempt. What we have is shown by the black lines. Looking left to right, there is a curved "step up" that forms a shelf parallel to the bottom of the board. This is what the front will be glued to.

Then there is another step up. This is also curved, gently at first (top of the picture), then more dramatically to where it comes off the back of the board (right side of the picture). This sharp curve is the problem. It should have continued down to the end of the board as shown with red lines. Additionally, though not shown, the red part also needs to

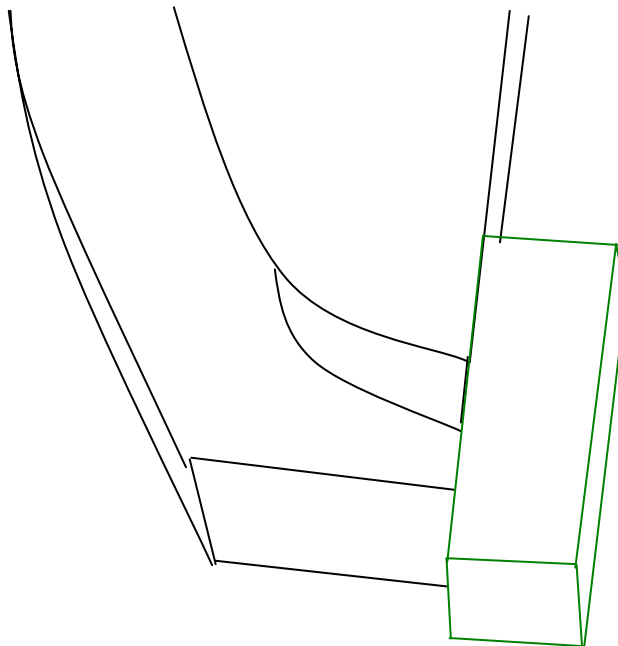
extend past the right edge of the board. The patch we need has to fit that quick curve, feather in to the gentler curve and extend the side a bit. ARG! ! ! ! ! Man, when we make an error, it is not a simple one.



This is too big a problem to face after such success with the rear rails and the day's template work. We retire to consider the problem.

## Saturday, December 15, 2007

Creating a walnut patch that matches the grain, the color and the curves is a technical challenge. Extending the board is not as hard, so we do this first. We simply find a chunk of walnut in the correct color and glue it to the side. Extending the above picture we end up with the new wood (in green):



Now we have to fill in the curved area. This is a real killer but Charlie has a brilliant, if somewhat unorthodox, idea for a wood shop: Build some forms around the area and then pour in some Bondo. In its liquid state (more like soft paste), it will flow around the curve and match it perfectly. Once hardened, it can be removed and used as a template for cutting a small piece of walnut with the table router. Yes, this is good! None of us have used Bondo before – the adventure continues!

To protect the walnut, we use wide cellophane tape to carefully cover all areas that will be exposed to the Bondo. Next, we build up the form to hold the Bondo in place until it hardens. While Charlie and I do this, Cal makes a run to the auto parts store to get some Bondo.

We mix up the Bondo base with the hardener until we have a uniform dull mauve paste. We scope this into place with putty knives, smooth it out, clean up, and head off to lunch.

It works beautifully – Life in the Shop is good!

*2007 Draws to a Close for the Pulpit*

# **The Narrative**



**2008**

## Saturday, January 5, 2008

Blessed Be - It worked! Naturally, we could not wait for an entire week to pass, so the next day (Sunday, December 16, 2007), Charlie went into the Shop to check it out. We move forward.

Another chunk of walnut of matching color and grain is found. We sand down the bottom of the Bondo template so that we can adhere that surface to the walnut with carpet tape. A little maintenance to the table router to get it into correct working order, and we are ready to go. Mind, we intend to do this twice: first cut a prototype to make sure we have the process correct, then cut the final patch.

Fortunately, some of the wood we used to build the forms for the Bondo are stuck tight and we can use these to guide the small block of wood against the router bit. Fortunately, the part we need to cut is quite small and fingers near very sharp spinning objects is not something to be encouraged.

The process works great! Our prototype is perfect, it is no longer a prototype but immediately raised in status to the final work product (we knew it was all along). We dry fit it, make a few adjustments with some very, very sharp chisels and glue it in place with all kinds of clamps.

Life in the Shop is very good. It is like having wings and flying.

## Saturday, January 12, 2008

Back in the shop, and none too soon. Removing the clamps we see a very nice two-part patch to extend the front edge rail and correct the routing error. Both chunks of walnut we used for the patch were thicker than the final board, so they need to be made level. Additionally, we intentionally made the part of the patch that has to fit the curve a little thick so we could feather it into an exact match.

To get the height correct, some people would think of using a special saw that has the teeth set on only one side. However, we are definitely into power tools, so we use a router with a flat bottom bit to simply rout away the extra material. We are able to get it to within the thickness of a sheet of paper before moving to a sanding block.

To meld the patch curve perfectly, we turn to the router again. This time we use one of our old templates and a flush trim bit for a perfect match. Again, a little work with a block and some sandpaper, and the patch is complete.

This is good! We had a problem, we developed a solution, and implemented it. In the following picture, taken before sanding was complete, the edges of the patch barely show. They won't show at all in the finished product even if one knows where to look – and we aren't telling.





Our next task is to complete the templates we will use to cut the sides of the front panel. Finishing the patch went quickly so we decide to break for lunch and then come back to make some more templates.

Working with Bondo to create a template for the complex curves of the patch worked so well, why not use it for the larger curve corresponding to the sides? As there is no reason not to; that's what we decide to do. On the way back from lunch, we buy more Bondo.

Using old template material as forms, the only real work is to cover the walnut with cellophane tape, mix up the Bondo, and get it done. It takes very little time compared to the three-step process using the router.

While the Bondo sets we watch a little of the NFL divisional playoffs then return to the Shop. We remove the forms and the template is done; a much better template than we would have gotten with the router, and in much less time.

You can see the clean an edge of a Bondo template below:



This photo shows the two Bondo templates with their pressboard backing next to the walnut curve that they match.



This is very good! We will still use the three-element approach to make the final template for the front panel. But we have the two sides, and the center connecting piece can be any scrap wood. The next step is more ASSEMBLY! We will glue the front walnut rails to the sides and use these to get the alignments for the font panel. Next week will be exciting!!!!

## Saturday, January 19, 2008

It's good to be in the Shop when we are on a roll, and knowing that we will be doing some assembly adds extra excitement. The plan is to glue the front walnut rails to the sides. It is critical that we get the curves to line up correctly – this is one of those “you only get one chance to get it right” situations.

We have a little more experience with “one-chance” situations now, so we approach this with some practiced skills:

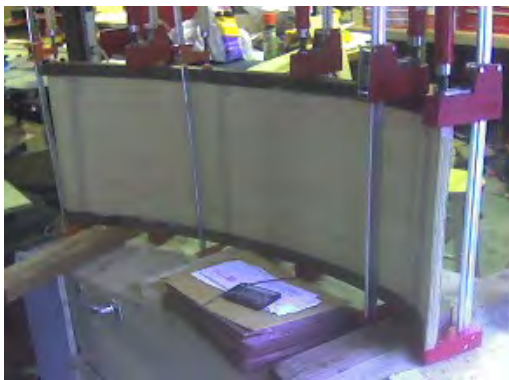
1. Lay out all the clamps and materials.
2. Do a dry assembly.

3. Apply tape to the maple sides to prevent any glue squeeze out from getting into the grin.
4. Stage up all the clamps, materials and the Gorilla Glue.
5. Make the commitment and glue it up.

Not a problem! It all goes very quickly. On with the glue, on with the walnut, on with the clamps, off with the squeeze out. In fact, it seems like we spend more time cleaning off the foaming glue squeezing out from between the seams as we do the actual glue application, assembly and clamping.

One side is done, on to the next. Same process, including the assembly dry run. **Fini!**

Time for lunch while the glue sets up. Life in the Shop is so good!



After lunch, we put in some more time cleaning up the glue squeeze out. The foaming Gorilla Glue is now the consistency of a thick paste and has to be carefully scraped off with various implements of destruction, that is to say: screwdrivers and putty knives.

Life in the Shop is good! It is a real shame that we have to go to work (to earn money) and must wait another seven days before we can get back into the shop. Sometimes life is hard – even when it's good.

## Saturday, January 26, 2008

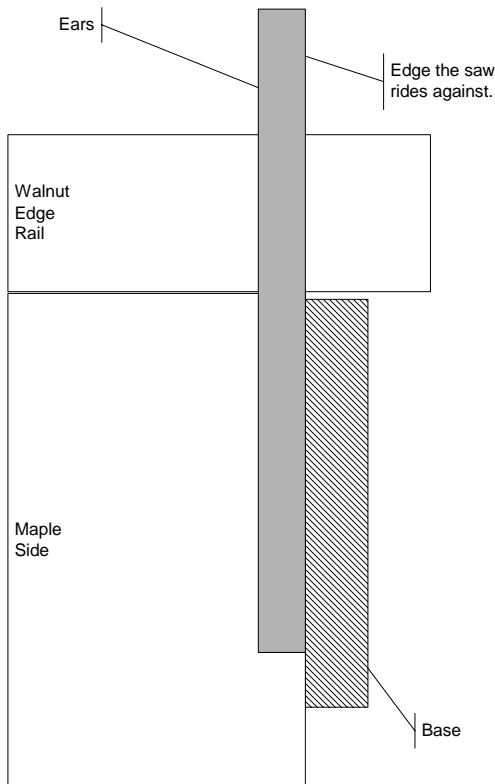
Off with the clamps – the curved maple sides with their walnut rails look *so* good! The next step is to trim the bottom of the walnut rails to be flush with the maple sides. This is tricky, another one of those times when you can really mess things up. Cal and I are a little perplexed as to how to do this “just right”.

Not a problem, Charlie has a solution (again): rabbit ear guides for the little Japanese hand saw. Cal and I are a little aghast at not being able to use power tools, but the Japanese saw is kind of cool – the blade is very thin with teeth set only on one side. This leaves the other side absolutely flat for riding against the rabbit ears. Besides, we can use power tools to construct the guide.

The idea behind the guide is simple:

- One piece of wood forms the base of the jig and this sits flat against the bottom of the maple side that the cut must line up with.
- Two tall pieces (the ears) are attached to the jig base so that they are parallel with the bottom of the maple and extend above the walnut edge rail on both sides.
- The smooth side of the saw (opposite the teeth) is kept flat against the ears while cutting the bottom of the walnut edge rail.

It pieces together something like the following (although we had to use a few more pieces to make sure the guide stayed in place while we worked). The picture on the right shows a finished cut.



We used this technique to cut the bottoms of all four edge rails flush with the bottom of the two sides. It works! But takes awhile so we are very late for lunch.

Never-the-less, life in the Shop is good.

## Saturday, February 2, 2008

It's getting hard again. We know what we need to do, but don't know how to do it. We are designing a cutting template for the front panel of the pedestal. We need to align the two sides in their final orientation and then place the two Bondo templates between the sides and screw them together. This gives us an intermediate assembly that has the two curved sides of the front in correct alignment.



But with so many degrees of freedom its hard to get everything lined up and held fast. We must think! The first step is to get out our old jig for the bottom. We can use this to hold the bottom of the two sides in correct alignment: the correct distance apart and parallel.

Next we get out the old jig that holds the narrow part of the pulpit apart at the correct distance. This gives us two fixed elements, but it effectively forms a parallelogram; there are still ways that it can all shift, but it is the best we can do.

## OOPS! My Bad

Our lives got busy again and we missed several woodworking days. On top of that, I neglected to update this story every Saturday, and enough time has passed that I've forgotten exactly what we did on what weekend. However, the story goes something like this:

Using the Bondo-based templates for the front sides and the sides assembled as per above, we lined everything up (it takes all three pairs of hands) and then screw the two templates together with a scrap board. This is critical as it defines the front. Fortunately, it works out very well!





We have all kinds of scrap material from the template sticking out both above and below the sides.

We don't care too much about the top right now as we will have to mill that later once the entire pedestal is assembled. However, getting the bottom aligned is critical so we work on that.

After getting the bottom of the template measured and cut, we move on to transferring the results to a working template that will be used to cut the substrate. This was not hard, we just used the good old Bosch Model 1617EVSPK router with a Freud 50-138 Carbide-Tipped Top-Bearing Flush-Trim Bit. We have made so many templates it's easy work, but we still have to be careful, especially cutting the bottom correctly.

We mounted the second order template in the pedestal as a dry-run assembly and it fits really nicely.

We have reached another important milestone. Everyone is very happy!



The pedestal is coming together, we can see how it will look when completed. Still lots to do, but seeing this is very rewarding.



## **Saturday, April 19, 2008**

Cal is out, Charlie and I rebuild the jig we use to hold the base of the pulpit correctly. We had originally made it as a temporary thing but now it has become a critical part of our assembly process. While double-checking things we find that it is not square. We need to address this before starting the shelves. So we take it apart and reassemble it with great care to make sure everything is exactly square and correct.

## **Saturday, April 26, 2008**

During the week, Cal bought a big sheet of 1/2" maple plywood for making the shelves. Charlie is working this weekend but Cal and I start making the bottom shelf. This turns out to be a little harder than expected. We should be used to this by now. At least we know to build a prototype first.

In this case, the issue is that the interior of the pulpit sides are curved, so we need to cut the sides of the shelves at an angle. Working on the interior of the pulpit is hard because



it's such a small space. Using several of Charlie's fancy measuring tools, we figure it's a 17-degree angle. We set the angle of the blade on the table saw, cut some scrap to test the angle and, what do you know, it *is* the right angle.

But, alas, nothing is that simple: the inside of the curved sides are neither parallel nor flat. We need to do some custom trimming to get the bottom shelf to fit correctly but we do get it to fit.

Life in the Shop is good.

## Saturday, May 3, 2008

The question now is how we are going to attach the shelves to the sides. Charlie wants to use pocket screws, he has this new tool. However, upon reflection, we realize that pocket screws need at least  $\frac{3}{4}$ -inch-thick shelf stock, and we have  $\frac{1}{2}$ -inch. Bummer.

But wait, we discussed trimming out the back of the shelves with walnut to hide the nasty edge of the maple plywood. And we had talked about making that edging at least one inch to balance with the side edging. What if we double up the plywood for the shelves? This will give us just shy of one inch for the shelves (plywood is not really  $\frac{1}{2}$ -inch thick) and we can use pocket screws.

We quickly cut another blank and glue it to the "prototype" shelf we have already made. Well, it's not a prototype any more, it fits so well that it has now become the real thing!

## Saturday, May 24, 2008

We had planned is to install the bottom shelf today but Charlie has to work for his paying employer and cannot make it to the Shop. We need his tool for cutting pocket screw holes and search through all the shelves in the Shop without success. *We are bummed!* We are ready to give up, the frustration is running deep, but, wait, what's that sitting on the work bench?? Duh! It's the pocket screw kit, Charlie had done some testing and left it for us right out in the open where we would not see it.

Well, then – off we go. First, check the instructions (we really did not need to read the instructions, we just did it out of respect for Charlie's tools). Then we clamp up a test board and BUZZZ – it works! We screw it into a test board of the same thickness as the side and it works great!

Life in the Shop is good. We decide to install the shelf and call it a day.

So we trim the bottom board we had glued to our once-upon-a-time prototype. Next we cut some temporary legs for the shelf to hold it level inside the pulpit and at the correct height. Now we ready to do some assembly.

**OOPS!** The shop gods must be unhappy with our exuberant self-confidence and feel that we must be put back into our humble place. Despite our tests, the first screw we drive into the pedestal side goes clear through. ARG is the only polite thing I can type. The

universe comes to a grinding halt – what the #!&\* did we do wrong? It worked so well with the test run. It is what it is, so we back out the screw and switch to a shorter screw.

The shelf is in place, it is level and it looks good. The only reason we can think of for that screw being too long is that the pocket screw device must have slipped while we drilled the holes in the shelf. This allowed the screw to travel further into the side than during our test. In the future, we need to be more careful about clamping the pocket-hole drilling jig to the shelf: the vice-grip mechanism that comes with the jig is clearly not adequate. Next time it's Bessey's turn to hold the drilling jig in place, Bessey has never let us down.

So, who is Bessey? Bessey is a German manufacture of tools and makes particularly fine clamps. If we put a Bessey clamp on something, we know it's not going to slip. We use these clamps so often that we typically just say, "Bessey it."



## Sunday, May 25, 2008

After church, we take a quick trip to the Shop. We cut blanks for the other two shelves and glue them up so that we will have the final thickness of wood for our next shop day when we will make the last two shelves.

## Saturday, May 31, 2008

The assembly stage is always exhilarating! We feel like we are on a run! We have the stock for the two upper shelves all glued up and a plan for what we are going to do today. Off we go:

1. Cut 2x2 standoffs to get the correct spacing between the bottom and middle shelves. In the photo, these are piled at the bottom of the pedestal.
2. Cut the middle shelf to fit.
3. Cut another set of 2x2 standoffs for the correct distance to the top shelf.
4. Cut the top shelf to fit.
5. With all shelves in place, determine the line that passes through the front center of the shelves. A plumb bob and gravity work really well.
6. Break for lunch, it's been a long morning but we are making such great progress that we agree to return and finish the installation after we eat.
7. Remove the shelves and lay out placement of the slots for the vertical dividers.

8. Using the table saw, cut the slots that will hold the vertical dividers: Two slots in the top of the middle shelf, and two slots in the bottom of the upper shelf.
9. With the shelves out, drill the pilot holes for the pocket screws: Two screws at each corner of each shelf.
10. Fit the shelves back into the pulpit with the spacers to keep everything aligned and level.
11. Screw in the shelves and it is done!

Oh, life in the Shop is *so* good! It's been a very long day, but we have the shelves installed. Yes, we still have to cut the material for the vertical dividers but we can do that quickly next week.

At last, the time has come to address the curly-maple veneer for the front. This is a major effort with little room for errors. We need a special planning session.



## Friday, June 13, 2008

Tonight is a planning session at Sneakers (woodworkers require food and drink to do correct shop planning). At issue is cutting the Curly Maple veneer for the front. How are we going to do this? We cut the veneer for the walnut, but those boards were not as big as the Curly Maple stock we want to work with.

Dinner and Guinness inspire us. Hmmm, seems that each of us has a different idea about how to approach the problem. It's round-robin time, each of us presents our ideas then we look for common ground and techniques that can actually be applied with the tools we have. Eventually we agree to Charlie's approach that goes like this:

1. Square up the sides of the board using the table router. It would be best to use a joiner but Charlie has not bought one yet so we have to make do.
2. Cut the board in half length-wise using the band saw.
3. Smooth out the cuts we just made using the planer, that is, we plane one side of each board.
4. Cut each of the two boards in half length-wise using the band saw.

5. Clean up the cut surface on one side of the two outside boards using the planer and then work all the boards down to something a little over 1/8" thick.
6. Book-match the boards and glue them to the substrate we have already cut for the front.
7. Trim the veneer to match the substrate using the router.
8. Evaluate the result to see whether it is "flat" enough or if we need to take it to someone with a big sander where we can run the full work-piece through all at once.
9. Assemble the front substrate with veneer into the pulpit.
10. The front walnut edging must match the veneer. If it's close, we will just do some sanding. If there is a lot of material, we will use the router to trim it down first and then sand.

We have a plan. But we remember the lessons of the Shop Gods, so we agree to get a chunk of poplar and practice using the band saw.

## **Thursday, June 19, 2008**

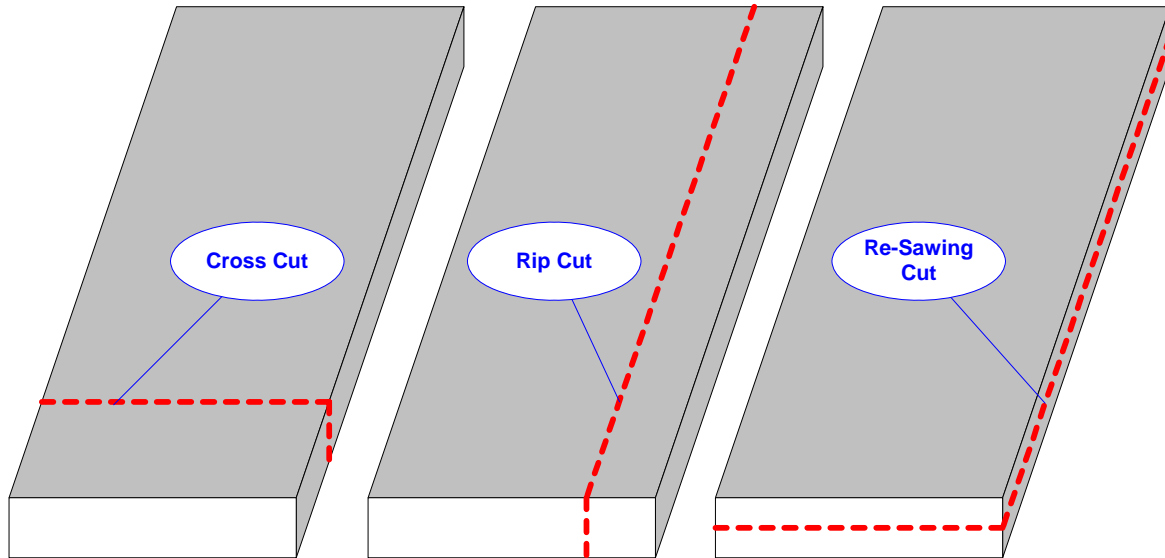
Cal buys the poplar boards we are going to use for practicing our veneer-cutting technique and we glue up the two boards to get the correct thickness.

## **Saturday, June 21, 2008**

Man it is hot, at 10:00am its already 88 degrees outside. The goal for today is to try our skills at cutting veneer. It should be simple:

1. Set up the band saw
2. Make a cut
3. Check to see if we are happy.

Now cutting veneer is not like any of the other kinds of cuts we are used to making.



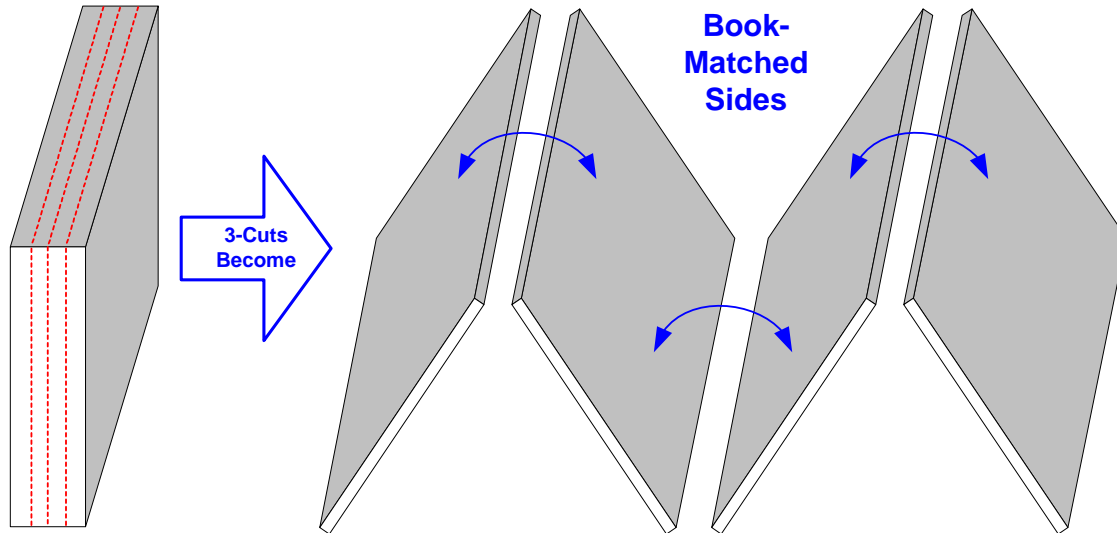
Most people do a Cross Cut (cutting across the grain of the wood) to get a board to the correct length. The cut is not too hard as its short and the wood is typically not very thick. Easy to do with a hand saw.

A Rip Cut is also common to get a board to the correct width, but it's harder because it tends to be a longer cut. Best to start thinking about using power tools here.

To make veneer you have to make a Re-Sawing Cut, and that is a real pain. Not only is the cut long (the length of the board) but it's also thick as it's the full width of the board. Plus, really nice hardwood tends to be less thick so you have to be really careful to avoid wasting any wood. ARG! ! ! !

In our case, the Curly Maple boards we have are 15/16" thick, 7 1/2" wide and 53" long. Out of this we need to re-saw four book-matched pieces that are 1/8" thick, doing this will require three Re-Sawing cuts. We have 7/16" in thickness for the veneer, blade kerf, and any OOPS!

The goal of book matching is to have grain that appears mirrored across a joint when the boards are next to each other. With curly maple this creates a very dramatic appearance.



But we have to be so careful! The cuts are difficult and we don't have much extra wood available for recovering from any mistakes.

## **The Lesson from Past Experience: PROTOTYPE & PRACTICE!**

Which is why we bought and prepped the poplar board for today's effort.

Down to work! First we run the poplar board through the table saw to clean up the edges (Rip Cut). This also makes it the same width as our Curly Maple board.

Next we set up the band saw. We check to make sure that the band saw table is perpendicular to the blade, set up the fence and start cutting. Strange, we are having to push harder than we expect to feed the board through. What's that? Smoke is coming out of the cut – something is wrong! STOP THE SAW!

Charlie could not join us in the Shop today, but we need his input, woodworking teams are required to have cell phones so we can give him a call. Charlie says that the probable cause of the problem is a dull blade! This explains both the need to push hard and the smoke caused by the friction of “rubbing” wood off rather than “cutting” it.

Charlie has other band-saw blades, but not what we really want. Time to break for lunch and then stop at the wood-working tool shop on the way back to buy a new blade.

The wood-working gods must be pleased with our efforts, the wood-working tool shop has exactly the blade we want by the manufacture we want and it only costs \$30.00. We take the saw apart and install the new blade.

Back to the poplar test board which now slides through the blade much more easily. The cut is done so we get out the micrometer and check our efforts.

More practice is necessary! The thickness of the board we re-cut varies too much, and varies from top to bottom as well. What we need is a better fence: Something really solid that will provide a full seven inches of support for the board as we slide it through. Again, we are thankful for the lesson of prototyping.

## Saturday, July 5, 2008



During the week I took some time off from work and went to Allen Steel to hunt around for a nice big piece of 4" x 4" aluminum with a very square edge. I bought a 2' section to use as the foundation of our new re-sawing fence.

Using the table saw, we cut a 2' x 7" piece from some high-quality birch plywood and bolted it to the aluminum channel I bought.

We then clamped this to the band saw table and re-aligned the table to make it perpendicular to the blade, a much easier process with a 7-inch-high fence.

Time for another try with the poplar test board. We set up some "finger boards" on the table to keep the bottom of the poplar against the fence and I use my fingers to keep the top of the poplar against the fence. Cal feeds the board and Charlie does the receiving.

It cuts smoothly and the micrometer shows a very even cut: top to bottom, and front to back. Life in the Shop is good.

Now to test our skills at cutting the poplar to a specific thickness. We need a "micro adjustable" fence for the band saw, but all we have is this big chunk of aluminum channel with plywood bolted to it and some clamps. Micro adjustable it is not.

But Charlie has an idea. We can clamp a backup board (the high-quality birch plywood with a really straight edge – table saws are wonderful things) to the table top hard against the fence. Then we can loosen the clamps on the fence and use old-fashioned feeler gauges (remember setting the gap on your old Volkswagon bus spark plugs?) to make adjustments as fine as 0.001" – it works! Life in the Shop is good.

Our next test with the poplar goes equally well: the width is just what we want. Time to cut the real thing: our expensive Curly Maple (\$75.00 for two boards). No time for the meek, this is the real nitty-gritty of wood working. No wimps in the Shop today.

We adjust the fence and the back-up board to cut down the center of the Curly Maple. We make another test cut on the poplar just to double check. Time to commit, time to cut the Curly Maple and -- IT WORKS! Man, that was intense! I can breath again!



It's late in the day, but there are only two more cuts to do, down the center of each of the two boards resulting from the first cut. We mark the two boards that we just finished cutting so we can get the book match correct, use the feeler gauges to adjust the fence, test, adjust, test, adjust, test, adjust, test ...

Take a deep breath, cut the Curly Maple and -- IT WORKS AGAIN! We are so pumped.

One more cut to make, test, adjust test, adjust, test, adjust, test ...

Take a deep breath, cut the Curly Maple.

**OOPS!** The thickness is off. We were too tired and too eager to make the last cut. Our last adjustment was the correct amount (0.005") but we made it in the wrong direction. Now one of our four boards is noticeably thinner and one is thicker than the other two. **We are bummed!** But it is done, and the thin board is over 1/8" thick so we are still good to go.

We clean up the shop in relative silence – we are still bummed. We know better than to push it when we get tired. But our enthusiasm got the better of us. It is what it is, we can carry on, we don't need another board.

Yet another lesson from the School of Hard Knocks – it seem like it takes a lot of those for us to learn the simple lessons. ARG!

## Saturday, July 12, 2008

Charlie is out today but Cal and I to continue work with the Curly Maple veneer. The plan for the day is not very full:

1. Plane the veneer down to a more uniform width.
2. Cut a really straight edge on the veneer to support the book matching.

The veneer boards are not very thick so we run them through the planer with great care. At each pass we adjust the blades by a little less than 1/64". The first two passes don't take any wood at all, then we get just a few high points on the thickest piece.

It's a long slow process but eventually we get all the boards down to the same thickness, just a little over 1/8".

Next step is to cut the edges of the veneer. There are two huge issues here:

1. Get the book-matched edges really straight so there are no gaps when we glue them together.
2. Don't damage the wood.

Not damaging the wood is much harder than one would think, the grain on the Curly Maple is not straight, it goes in all different directions, constantly changing, and can be very delicate. It's so thin, a piece may easily chip out.

Our proposed technique is to:

1. Align the veneer to get the best book matching.
2. Tape the matching faces of the boards together so they don't move relative to each other.
3. Place them in a sandwich of two other boards to keep the veneer stable.
4. Use a router with a flush cut blade to trim the veneer using the sandwich boards as the guide.

We need to make the boards for the sandwich first and this requires a really straight edge. Back to the table saw to cut the birch plywood to size, then we clamp on a cutting guide. Break out the router and see how straight an edge we can get. It looks good, but best we should make a practice pass – we have learned some lessons.

We will practice using the two pieces of veneer for the outside edges of the panel. This gives us two edges that we can practice on without cutting into the edges that will actually be displayed.

We make some index marks, tape the boards together, put them in the sandwich, and rout away. Then we open up the sandwich, un-tape the veneer, and open up and lay down the two boards to see how they match...

**OOPS!** The ends of the two pieces of veneer match very tightly, but there is a gap in the center. The gap is less than 1/16" but is totally unacceptable! There must be a 1/32" bow in the "straight edge" on the sandwich boards that, when applied to each of the veneer pieces, gets doubled.

A mad scramble ensues to find the cause of the bow. We find every reference edge in the shop and use each to test the edge on the sandwich – yep, all references show that its bowed. So what about the guide used to cut the edge – yep, references show that this is bowed also (so much for that as a reference).

So now what? **Time to stop!** Last week we caused a big problem by adjusting the band-saw fence in the wrong direction and we don't want to risk another mistake.

Time for lunch, but the mood of the Shop is quite solemn.

At lunch we decide to wait until Charlie can join us to evaluate the situation and help decide how to proceed. We take the afternoon to do a thorough job of cleaning and organizing the Shop.

Life goes on, but all is somber in the Shop.

## Saturday, July 19, 2008

We start early today and all three of us are here to work on solving the problem of cutting an absolutely straight edge (well, at least straighter than what we have managed so far) on the Curly Maple veneer.

Our first attempt is to try getting a better edge on the sandwich from last week. We use a different reference and true up the birch plywood sandwich. Then we repeat the process of aligning and taping the veneer, forming the sandwich, zip goes the router; out comes the veneer, open it up and ...

**OOPS!** There is still a gap in the center of the cut. Better than last week's effort but still not acceptable. We also have a problem with some of the veneer chipping out. This scares us big time. The sandwich was intended to stabilize the veneer and prevent chipping but – ARG – it chipped out anyway. It's a good thing we are working on edges that won't be part of the finished work.



A different approach is needed for both cutting and getting a really straight edge. We turn to the table saw with its micro-adjustable fence. We will use the same sandwich techniques, but with each pass at the saw, we will cut through the full sandwich. The birch plywood is too good to sacrifice in this way, so we will use some cheap press-board to form the sandwich.

First we cut our full sheet into workable sections with a circular saw. Press-board is nasty to work with! It creates more than its fair share of dust and the air is just full of “stuff” as we make our initial cuts.

Note the saw guide in the picture – good enough for press-board, but this is the “reference” that gave us the 1/32” bow in our previous tests.

Time to create the sandwich to run through the table saw. The process is similar to our previous efforts:

1. Align the grain for the book-matched edges of the veneer.
2. Fold the veneer together maintaining the alignment and tape the two boards together so they don't move relative to each other.
3. Put this into the sandwich and align the edge of the veneer to the edge of the press-board.
4. Because this is going through the table saw we can't use clamps to hold the sandwich together so we screw the assembly together, being careful not to go through the veneer.



5. Take the complete sandwich and through the table saw we go. Man, it makes a lot of sawdust. But the press-board cuts easily so, while handling the assembly takes all three of us, the cut is quick and easy.
6. Disassemble the sandwich, un-tape the veneer, lay it out on the table matching the newly cut edge, and ...

We have lift off – the cut is not “perfect”, if we put a light source under the seam we can see light in the center, but its MUCH better than what we have gotten before. We are good to go!

The other cuts go quickly. We lay out the veneer boards, rub them down with mineral spirits to bring out the grain, and ...

It's wonderful. The grain and the spalting (black streaks in the grain) down the center of the book-matched boards is gorgeous. Talk about inspiration for completing the job! This, combined with seeing the general shape of the pedestal, would touch the heart of any true wood worker. We take a moment for silent prayer and reflection.



Time to clean up. Life in the Shop is remarkably good!

## **Saturday, September 27, 2008**

It's been a long time since we have been in the Shop. Charlie is having his kitchen remodeled and his contractor is using the shop for storage. (We have an interesting discussion about whether using a shop for storage is sacrilege: Results to be published at a later date).

Cal has been on several family trips and I had to go into the office for several weekends as the product ship date approaches. ARG! ! ! Life seems to get in the way of the important stuff: Making sawdust!

Today the three of us gather to glue the Curly Maple veneer to the plywood substrate. We also want to build some prototypes so that we can test our ability to flush cut the uneven grain of the Curly Maple without chipping it. Recall that we had a problem with this when we experimented with using the router to get an absolutely (well, as close as possible) straight edge on the veneer for the book matching.

The effort goes like this:

1. Rough cut the little parts of the veneer that go on the four corners.
2. Align the grain for the center book match (reflection) and use special perforated veneer tape to keep them together and aligned.

The veneer tape has to be wetted down before being applied. We put one strip down the center then several strips going across the grain.

As the tape dries it is supposed to shrink and pull the seam together.

3. Match the four corner pieces and tape them together also. We use some small clamps to get the wings at the bottom to stay in place while the veneer tape dries and pulls the joints together.
4. Once all the grain matching and taping is done, spread glue on the substrate.



**OOPS!** Where is the glue? We bought a bunch of it and it was right here in the Shop, next to the glue for dark wood. Could it have been usurped by the people remodeling Charlie's kitchen? Not that the kitchen is undeserving of such a fine wood glue, but we had been counting on it for today's effort.



Oh My – there is bad news and bad news. We found the glue downstairs among the kitchen remodel tools and supplies. However, it has all been used up and there is no replacement visible in the vicinity of the remodel.

BUMMER! We are all set to do some gluing and now we have to go buy some. We figure this is a manifestation of the Shop Gods telling us that it's lunch time. With great respect and humility, we accept the guidance and proceed to lunch and the hardware store.

5. Returning from lunch, we are back in stride. We apply the glue, lay the taped-together veneer on the substrate and match up the alignment marks.
6. We put two boards over the veneer to spread the force of the clamps over the surface. Then we load on the clamps and weights to make sure there is an even adhesion.  
**Don't even think about it : It's simply not possible to have too many clamps!**



Having declared success with applying the veneer to the substrate, we quickly assemble materials for testing finishes by gluing some scrap veneer from the trimming in Step 1 to some scrap press-board.

That's all we can do for today. The glue needs to set then we'll do our tests with flush-trimming the veneer. During the week I will pick up a new flush-cut router bit (the 1/2 shank model, of course) to ensure the sharpest possible cutting edge. The last thing we



want is to chip out a bit of the complex grain that will be on the front of the pulpit. If that happened, we would have to go all the way back to re-sawing and planing our second board of Curly Maple. Yes, it would be faster the second time around (well, third time if you count the prototypes), but it would cost us another three or four weekends. Let's not even think about that.

## Saturday, October 4, 2008

Just Charlie and I in the Shop today. It's time to trim the edge of the veneer to be flush with the substrate. We are fearful that there will be "tear out" of the irregular grain of the Curly Maple when we cut it with the router. But there is nothing for it, we have to use the router.

We have a plan though:

1. During the week I purchased a new router blade. The hope is that using a new super sharp blade will help reduce the chance of tearing out any wood.
2. We will sandwich the veneer by using the template for cutting the substrate. This way there will be solid wood above and below the veneer.
3. We will use a router technique called "climb-cutting." This means that we cut in the opposite direction that's normal for using a router. It goes slower, and tends to push the blade away from the wood, but it also has less of a tendency to "grab" and pull loose any wood.

We triple check everything and start cutting. Not a problem, the cutting goes well and does not take us long to finish. It looks so good. Time to dry-fit the front panel.

**OOPS!** (more accurately, "expletive deleted"). The front panel does not fit. We are baffled and it takes us awhile to realize that we made the error during glue up. The veneer is on the wrong side of the substrate! Somehow, after we set-up last week, we must have moved the substrate from our working area and put it back upside-down. We are very upset! Very, very upset! Very, very, *very* upset!

As there is nothing to be done for it, we'll just have to stop and consider alternatives.

Did I communicate that we are: very, very, very, ..., **extremely** upset?

## Saturday, October 11, 2008

The three of us gather to consider our plight and try to figure out how to recover. It is what it is and we identify our options as follows:

- Try to adjust the walnut rails on the curved sides. It took us three prototypes to cut these rails initially, so we decide not to take this approach.
- Create a new front panel from scratch. We have the original template for the substrate and we have a second board of Curly Maple. Cutting the substrate would be easy, but creating new veneer will take several weeks, and more

importantly, we don't think the second board will look as good as the first. Still, this is a viable option.

- Trim the current front panel to fit the sides. This means that we will make the pedestal a little narrower. We would have to disassemble the base, trim the shelves and re-assemble everything. The concern is that, in making the pedestal narrower, we may lose the graceful proportions of the design.

**ARG!** We have gotten ourselves into a very unpleasant situation, all because of one simple mistake! Well, the decision is made, we will trim the current front panel. It is only going to cost us between a quarter and an eighth of an inch in the width of the pedestal. It will also be the least work all around.

**Time to be honest with ourselves, we have put a lot of hours into this project and it is getting old.** We want to finish it, but it is clear that the drive to finish has affected our Shop discipline. We must be even more careful to not go fast just to get something done. The cost of a mistake is too high at this stage. More rigor is needed to double check everything. There is a reason for the mantra:

**Measure twice and cut once!**

## **Saturday, October 18, 2008**

We carefully align the template for the substrate on the top of the veneer, making adjustments so that we trim the least off the front panel.

Once aligned, we clamp and attach rails so that we can slide the template left and right over the front panel without getting any change in the up and down alignment. Time to cut with the router again using the long straight cutting bit (roller bearing on the top).

Fingers crossed and we cut the left side of the veneer/substrate. We hardly breathe when shifting the template the minimal amount for trimming the right side. Fingers crossed and we trim the right side of the veneer/substrate.

We dry-fit the trimmed front panel into the base. Hard to tell, but it looks like it will work. Seems that there might have been some up/down shift between trimming the two sides but it's very hard to tell. We will have to proceed and see what happens.

## **Saturday, October 25, 2008**

Time to disassemble the pedestal so that we can trim down the shelves. We do a careful review of the work to be done and decide that, while the pedestal is disassembled, we should trim the back walnut rails. We want the outside edge of the rail to be flush with the outside edge of the curved maple side and the inside edge to be about a quarter inch proud of the inside of the curved maple side.

The inside edge of the back walnut rail needs to extend a little so that it hides any seams that are created by the shelves meeting the curved sides. Recall that the side of the pedestal is curved, while the edge of the shelf is flat, though cut at an angle – they will touch at one point, but not over the entire width of the shelf. Also, we don't want the rear rails to look too thin relative to the rest of the piece.

Disassembling the pedestal goes quickly and we rig up a simple fixture to keep the router flat while we trim the walnut. Our first cut will be the inside edge. To get the stand-off we need, we clamp a sheet of quarter-inch Wiggle Board left over from making the core of the plywood sides; it's flexible and bends to match the shape of the side.

We also need to make an extended base plate for the router so that we can keep the bit parallel to the side. This does not take long, we use the table saw to cut some high density fiber-board and drill a few holes. It's done!

Time to start cutting, we check everything and away we go. There is a *CRACK* and we stop!

**OOPS!** (more expletives deleted). The walnut is so dry that the router bit, the new super-sharp bit, caught the grain and cracked it. Cracked it well into the visible rail. We are extremely upset, we realize that we should have been "climb cutting" with the router because the grain in the edge rail changes so much over its curve.

We have to fix this. After some discussion, we decide that we will inject some glue into the crack then clamp the wood together. But we don't have any glue injectors, the standard source is veterinary clinics, you can get special syringes (without needles) that are used for irrigating ears and such. That's not an option at this hour, so we head down to the local Wood Workers store to see what they have.

The sales personnel recommend we use clear Cyanoacrylate (a.k.a. super glue) for the fix. We buy some and head back up to the Shop.

We'll have to be careful, we talk about how the three of us will coordinate applying the glue, clamping, and cleaning up any squeeze-out. This is critical, so we actually do a practice run (again, the lessons of prototyping).

Time to go for it! We do the gluing, clamping, cleaning, and head off to lunch. There is nothing more to be done right now. Cyanoacrylate sets fast but it actually takes a while for it to fully cure. We don't want to push our luck, so we are going to give it plenty of time.

During lunch we visit about how to do the trimming without cracking the walnut rails again. There are several ideas, but we can't settle on any obvious solution.

Upon our return, we remove the clamps. There is some discoloration, but a little sanding takes care of that. The fix is successful! Next time we gather, we will review how to proceed with the trimming.

## **Saturday, November 22, 2008**

Charlie has been thinking about the problem of splitting the walnut rails while trimming them. He says that we should be climb-cutting with the router and taking between a 16<sup>th</sup> and an 8<sup>th</sup> of an inch of wood (at most) at a pass. That means lots and lots of passes.

So now the problem has morphed into how to control the depth of cut with the straight-cutting bit. We have the Wiggle Board but that is only one thinness and we need more adjustability. At this point, I remember that among Charlie's vast tool collection is a rabbit-cutting router bit with a collection of different radius guide bearings to control the depth. I pose the question, "Can those bearings be used with our straight cutting bit?"

YES – the bearings are interchangeable, and the gradient between the bearings is about a 16<sup>th</sup> of an inch so we can control the depth of cut to the fineness that Charlie wants. We try it and it works. It takes four steps in bearings, with three passes for each bearing, but we make the cut without mishap. That is a total of 12 passes with the router.

We switch our setup to cut the second side; it takes the same number of passes, plus we are careful to go slowly. This also works!

Time to clean up and put everything away. It has been a successful day after a big disappointment. Life in the Shop is good.

## **Saturday, December 6, 2008**

With the inside edge of the back walnut rails trimmed, it's time to do the outside edge. But now we have a system. We set up, double-check everything, and do a practice run to make sure everyone knows their job.

Power the router and start cutting. Again, we have to make lots of passes but everything goes smoothly, so, while it takes time, good progress is made. Life in the Shop is good!

I have done some research the week before. A friend of mine, Ford Turping, has a friend who is a professional furniture maker and wood-working instructor: John Grue-Sheriden. John has a shop in San Francisco and he has agreed to let us come up and use his equipment to sand the front panel. This is a chance to get some input on how best to approach finishing the front panel; though John gives classes in furniture making, he will share his advice on dealing with our front panel for free. This is another unexpected opportunity to learn something new.

We have a plan for our next meeting. Life in the Shop is good.

## **Saturday, December 20, 2008**

We meet at Charlie's shop a little early then drive up to San Francisco to visit the wood-working studio:

**Grue-Sheridan Studio**  
3450 Third Street SE  
San Francisco, CA 94124  
Phone 415-824-6161

I am so used to heavy traffic while driving up 101 to San Francisco, that we have agreed to leave early. Naturally, according to Murphy's Law, there is hardly any traffic and we make it to the Islais Creek Channel area well before our appointment. We stop at a nearby coffee shop and have a mug to pass the time. At 11:00am we drive to John's shop.

It's closed. We look all around but there is no one there. We ask the neighbors and they have no idea about the shop hours. We are baffled. I call John; we can hear the phone ringing inside but no one answers. This is very frustrating, either I got the date wrong (the shop is closed between sessions) or the time wrong. But I have no way to verify any of this. In frustration we head home.

I will call John to find out what happened, then we will have to head up to San Francisco again in the New Year. At least we have had some good visiting and that has value.

*2008 Draws to a Close for the Pulpit*

# The Narrative



2009

## Saturday, January 10, 2009

The visit to John Grue-Sheridan's Studio in December was a flop because I had the time wrong. So today we return to San Francisco.

The plan is to use John's big panel sander on our extra thick, home-made walnut and Curly Maple veneer. It's an excellent outing and we have as much fun visiting with John, seeing his shop and his studio (including samples of his work), as we do running the big panel sander.



The panel sander is huge, the picture above shows us running the Curly Maple front through the machine. Cal put the work piece on the moving belt. As soon as I took this picture I dashed around the back to catch the wood as it emerged.

Good fun! We need to find some additional reasons to go back to John's shop.

John offers "classes" so that people can come in and use his equipment and get his guidance. Several people were there working there when we visited. It's a good resource for a big city like San Francisco.



## Saturday, January 17, 2009

Now that we have the walnut veneer ready, we can continue assembling the elements for the reader board at the top of the Pulpit. Our design has changed from constructing a hollow reader board based on a “truss box” design, to having a solid one. Consequently, we have lots of additional gluing to do.

But first we need to find a nice thick plank of walnut that will match, as best as possible, the walnut veneer we will use for the top of the reader board. We need this solid piece so we can route a channel for hanging seasonal-display banners from the front of the pulpit. While we are at it, we look for wood to construct the reader board edge banding. This actually takes a fair amount of time but the match is important so it is worth the effort.

The raw walnut needs a little planning before we can continue.



Integrating the top veneer with a solid walnut board looks like the following diagram:

Solid Walnut	Walnut Veneer
	Veneer Substrate
	Filler Board
	Filler Board
	Veneer Substrate
	Walnut Veneer

There are many, many glue steps to build up all this layering. We made the top walnut veneer and its substrate last year before we used the panel sander. Our next step is to glue this to the thick filler board. The important thing is to have enough glue over the entire surface.



So we put it together, put it under pressure while the glue sets, and it's off to lunch!

Next we cut the top veneer, substrate and filler board to approximate size. Then we glue that entire structure to the larger, but thinner, filler board. This second filler board will act as a substrate for attaching the solid walnut.

Everything is glued up and under pressure. We are done for the day!

## Saturday, January 24, 2009

Today we want to attach last week's work and the solid walnut to a common substrate. Our first task is to trim the edges that will abut so that there is no gap. This is very careful work with the table saw. Next we glue the assembly from last week to the new substrate and head off to lunch.

Upon our return, we glue the solid walnut to the assembly. We are not kidding when we say we put the glue joint under pressure, take a look at the photograph. We are talking several hundred pounds here!



Next we fine tune the fitting of the front panel. This is very careful work, mistakes here will be hard to recover from. We go very slowly with lots of dry fitting and hand work with a fine file. But we are successful, it all comes together well.



## Saturday, January 31, 2009

Today is a big day – we glue the front of the pedestal to the sides. Mistakes here would be unpleasant, so we start with a practice assembly to figure out the best clamping pattern. This is hard because there are few flat parallel places along the sides to clamp to.

Next we take it all apart, apply the glue and then clamp it up again. We make several passes to clean up any of the glue the squeeze-outs and then we are done with another *major* assembly step.

Lunch break!

The day is still young, so we put some time into the reader board. Using the plunge router we cut slots in the plywood on the back of the reader board for the microphone and light wires.

Time to clean up the Shop and call it a day.





## Saturday, February 7, 2009

Two tasks for today:

1. Refit the shelves to accommodate the changes in the front panel.
2. More glue work on the reader board.

First, the glue work on the reader board as that can be done quickly and set aside out of the way. Indeed, this goes quickly.

Next we start refitting the shelves. The trick here is to set the table saw blade to match the angle of the existing shelf, then:

- Trim off just a little.
- Test the fit.
- Repeat until it's just right.

Because we have been removing wood from one edge of the shelf, the existing pocket screws are probably too long. We snip them to make sure that they don't poke through the nice maple veneer on the curved sides of the pedestal.

It takes awhile but we get all the shelves refitted and screwed into place. It looks very nice. Time for chops!



## Saturday, February 28, 2009

The goal for today is to fabricate, but not install, the walnut trim for the back of the shelves. This is a little tricky because:

- The trim has to match with the inside curve of the back edge rails of the pedestal. Thus, we need to cut the ends at an angle.
- The trim has to fit exactly between the two back rails while sitting flat with the top of the shelf. The length has to be just right.

But not to fear, we have actually developed the skills that allow us to make cuts on the table saw to within 0.007 of an inch, consistently! We proceed with confidence.

First, we pick the stock. To match the color, we use wood left from cutting the back rails. We rough-cut this to width and then run it through the planer to get the thinness of the walnut to match the shelves – 31/32 of an inch – not a problem.

Next we run the stock through the planer again to get the correct depth. Then we cut the stock to approximate length for each shelf. Now it gets a little interesting, we need to measure the angle of the inside of the walnut rails at the point they intersect the shelf.

Surprise, Charlie has a tool for this! We take our first measurement, set up the table saw and make a test cut on one of the walnut scraps. The test fit is not quite right, so adjust the saw, try again--just right. We were only off by half a degree. So we proceed to the final cut on one edge of the stock. Now it gets *really* interesting, we have to make a cut on the other end and come up with **exactly** the correct length.

Our technique is to creep up on it. We mark the wood a little bit long and make our first cut. Then we cycle through the following steps until we get it exactly right:

1. Clamp the wood to be cut to the miter gauge so it does not shift during the cut.
2. Make the cut.
3. Before removing the wood from the saw, clamp a reference block to the miter gauge so we know exactly where the end of the board was when it was cut. This gives us a reference for alignment on the next cut.
4. Place the wood into the pulpit and guess at how much it is off. For simplicity, we limit our selves to three sizes of adjustment: 0.025; 0.014 or 0.007 inches.
5. Return to the table saw with feeler gauges and align the stock with the reference block, advancing it by one of the feeler gauge blades.
6. Clamp the wood to the miter gauge, remove the feeler gauge, power up the saw, make the cut.

Repeat the above process as many times as necessary to get an exact fit. It takes us around six passes to get it just where we want it.

Then we do it all over again for the other shelves. There are three shelves in total so it actually takes a considerable amount of time despite the simplicity of the operations. But we get it done, have lunch, return and clean up.

Life in the Shop is good!

## Saturday, March 7, 2009

Charlie is out rehearsing with the choir and the next big task is determining how to cut the top of the pedestal. This is crucial, we need all three of our brains to address this, so it must be deferred. So Cal and I build a prototype for the pull-out step that is to sit in the base of the pulpit. We use Bergerot Board and turn it out quickly.

The step is six-inches high, with simple lines, and lots of space for the feet.

We break early, and have a good lunch with lots of visiting.

## Saturday, March 14, 2009

Today is set aside for planning. The last really scary/hard task is to trim the top of the pedestal to accept the reader board. We want to fit the top reader board to the pedestal without any trim. The curves of the pedestal must “die” into the reader board. Very clean in design, very hard in execution. The top of the pedestal must be cut in a perfect plane to accept the reader board.

All three of us have been thinking about this problem for a long time and the solution is a hybrid of each of our ideas. There are two primary parts to the solution:

1. A framework, the jig, that surrounds the pedestal and defines a reference plane parallel to how the reader board will sit.
2. A tool rest that supports a plunge router used to “nibble” (mill) away the top of the pedestal so that it is parallel to the reference plane.

The trick is really the jig that defines the reference plane. If this is correct, then the router-milling technique should be easy to execute. But the reference has to be exact and rigid relative to the pedestal during the multiple days it will take to do the milling. The jig must be substantial.

The design is to form the jig out of four elements:

1. A solid reference base that the pedestal and sides of the jig will rest upon.
2. Two trapezoidal sides. The bottoms sit on the reference base, and the tops are cut at the angle that the reader board will have once mounted. **These boards must be identical!** These sides are fastened to the base with cleats to keep them from moving.
3. A front board that sits on the reference base and clamps to the front of the pedestal. The top edge of the front matches the high point on the two sides. Like the sides, the front is fastened to the base with cleats. The sides and the front are also fastened with cleats.
4. The pedestal will protrude through a hole in the “reference plane” with at least six-inches of surface surrounding the pedestal. Because it sits on the top of the sides and the front boards, it defines a uniform surface relative to the reference base that supports everything.

It seems simple, it should work. We need to purchase some materials and then it will be time to make some sawdust next time we get together.

## Saturday, March 28, 2009

We start early because we are excited about building this jig. It’s actually simple, though physically large. We lay out the materials, review the design, set up the table saw and get started.

We build from the bottom up, starting with the reference base on the garage floor. The pedestal is set into the center of this and cleats lock it into position without actually putting any fasteners into the pedestal.

We review the finished height of the pedestal as we need to make sure that the reference surface falls below this to allow “working room” for the tool rest and router. With this measurement triple checked, we make the cut for the boards that will go across the front of the jig (parallel to the front of the pedestal). The front boards are quickly cut and secured into place on the reference base with cleats.

Next, we cut the two side boards with identical slopes for the top. Like the front, these are secured into place applying cleats both to the reference base and the jig’s front boards.

Clamps secure the pedestal to the front boards and make it more rigid.

Next we go to work on the reference surface, a solid piece of  $\frac{3}{4}$ ”-plywood. We cut a big notch in the top so that it can fit around the pedestal. To fully surround the pedestal, we work in a filler piece at the bottom.

The basic jig is assembled, now we need to make sure that it’s both flat and level. We use shims to make fine adjustments and cleats to fix the reference surface into place.

While the work is straight forward, it takes hours. Too late to start on the tool rest so we break and call it a day. A very successful day – we are stoked and eager to return.



## Saturday, April 11, 2009

We have some simple goals for today:

- Build a tool guide for the router that completes the jig for trimming the pedestal.
- Start the process of trimming the top of the pedestal.
- Continue working on the reader board.



We decide to start work on the pedestal. With the part of the jig that defines the cutting plane complete, we need to make the rough cut with a reciprocating saw to take off the initial material.



To get the spacing correct, we lay the saw on two sheets of 1/4"-plywood and start cutting from the back. We can only go so far with the power tool as the base of the tool forces it away from the material as the curve of the pedestal increases. We can only make about 3/4 of the cut with the tool and have to finish the cut using a Japanese pull-cut saw. It works great – even though it is not a power tool.

The scrap material we remove will be used to test the finishing technique as it has both walnut and maple elements.

With the rough cut done, we have to finish the jig by using a milling bit to build the tool holder needed for the plunge router. This is a trough on legs that will ride on the reference plane of the jig. The cutting blade passes through a slot down the center and edges contain the router and prevent the surface from deflecting. With a table saw and a cordless drill it does not take much time to construct.

The router will ride on the tool guide; the guide can slide over the reference surface allowing the bit to access all points on the top of the pedestal.

Now for the true test, will this contraption work for milling down the top of the pedestal so that the reader board will fit flat and flush?

Oh, it is so nice when a plan comes together! We make several passes to work out the best technique for working with the router, tool rest and jig. We develop an approach that works well but it's going to be a long slow process. So Cal continues working on the pedestal while Charlie and I work on the reader board.



The reader board task is to make two holes for the microphone and light sockets. We start with the drill press and a Forstner bit. However, as the barrels of the sockets are irregular, some hand work with files is needed to make the fit exact.

The day's work is done. Cal has figured out the best technique for trimming the top of the pedestal. We have cleaned up and are talking about what is next for the reader board.

The original design called for a metal bar across the front from which a cloth can be hung. But no one really likes the idea of scarring the reading surface with such a channel. Charlie has an alternative proposal: use high-quality Rare-Earth magnets that can be embedded into the reader board from the edge before the banding is put on. This way there is no need for a channel or all the hardware specified in the original design. This is a much better solution, assuming that the magnets are in fact strong enough to hold the thick embroidered cloth. We will get some material and do an experiment next time we get together.



## Saturday, April 25, 2009

Oh man, we be humming today! We started early and reviewed the work to be done.

We start with some experiments with the Rare-Earth magnets that Charlie has proposed for holding the banners, vs. the channel, bar and clip approach of the original design. It works! The magnets are not strong enough to hold the cloth alone, however, with the cloth draped over the leading edge, there is enough friction between the wood and the cloth to hold it in place. So we will go with this solution.

The next priority is to continue trimming down the top of the pedestal. Cal has refined this to a art, so he takes the lead with this job. All goes well until we get a crack in the walnut (upper right rail on the pedestal as seen from the front). This brings all work in the shop to a screeching halt. (Charlie and I had been doing other tasks, see below). We consider the possible consequences of a crack in the wood.



**OOPS!** The walnut is old and very, very dry, which makes it brittle. But it is what it is and we have to move forward. We take a trick out of the lathe turner's handbook and use Cyanoacrylate (super glue) and some clamps to bind the cracking wood together. It works!

There is an additional lesson in this that we take time to consider. As we mill the pedestal down, we need really sharp edges where it dies into the bottom of the reader board. At the two front corners, the walnut has to come to a very sharp point to achieve the design. We consider the possible advantages and disadvantages of permeating the walnut with Cyanoacrylate before we start making the final cuts. The idea being that capillary action will draw the glue into the brittle wood and strengthen it before we make the cut. We defiantly don't want an "oops" on this critical part of the fabrication.

While Cal has been working on the top of the pedestal, Charlie and I have been gluing the bottom panel on the reader board. This is a tested technique, spread bunches of glue on both surfaces, sandwich the work pieces between scrap plywood to protect them while sitting on the floor of the garage, and piling 300 pounds of floor tile on the assembly. Then we add a few paint cans, and a huge old air compressor just to make sure that our "gravity clamp" is adequate. Well its worked before, so what can be said?

Believe it or not, it's already time to break for lunch. Charlie and I have finished our morning tasks, and Cal is to the point where adjustments need to be made to the tool guide before he can continue with milling the top of the pedestal.

We return from lunch and work continues. We make the necessary adjustments to the tool guide so that Cal can continue his task.

Charlie and I want to prototype how to set the brass page holder bar into the top of the reader board. The plan is to carefully cut a groove for a brass bar to fit into. There are several steps to this:

1. Spend some time straighten the brass bar I purchased during the week. Yes we are using re-cycled materials. Ecologically good, but requires additional labor.
2. Get Charlie's second plunge router out (Cal is using the Bocsh on the pedestal) and install the chuck flange needed for small bits. This takes some time because the router had been setup for working with a dove-tail joint jig.
3. Next we need to attach his micro-adjustable router fence. Always good to work with new tools.
4. Setup some wood for making practice cuts. We need to verify our technique with the new router with its micro-adjustable fence and determine what the correct depth of cut will be.
5. "Measure twice, cut once" which in this case means setting up stop blocks to accurately control the length of the cut over multiple passes.

All is ready and it falls to Charlie to make the cut. It works very nicely. It really pays to have the micro-adjustable fence.

Time flies when you are having fun. It's late afternoon already and time to stop and clean up. There is a bunch of clean-up this time. We have had two routers running without extra hands to hold the vacuum. So the wood dust is all over the place (another reason we wear filter masks in the shop). Several passes with the Shop Vac and we are done for the day.

We have made so much progress in one day that we can see how the entire project will come together. Plans are made to start early next Saturday.

**Live in the shop is VERY good.**

## **Saturday, May 2, 2009**

We continue to be on a roll with work proceeding on two concurrent tracks:

- Cal focuses on milling the top of the pedestal
- Charlie and I work on the reader board

Over the last two weekends Cal has developed and refined his technique for milling the top of the pedestal. So he is the logical one to continue with this work. We review the concerns we had last weekend regarding breaking off the sharp points on the top front walnut rails. We decide that reinforcement with Cyanoacrylate is not necessary, especially considering that it may be visible once we apply the finish.

We adjust the feet on the tool guide for the final milling pass and Cal is off and working.

Meanwhile Charlie and I talk about how to proceed with the reader board:

- 1) Trim the bottom panel that we glued on last week so that the reader board is the correct size except for the trim.
- 2) Install the magnets.
- 3) Cut the opening in the bottom for the microphone and light cables.
- 4) Start on the trim.

**OOPS!** We discover that when we glued on the bottom of the reader board we should have been more careful about the “squeeze out”. The extra glue ran down the sides of the reader board and seeped between the plywood we used as a base and the walnut that forms the top. Once again, we got into a hurry and forgot to put down wax paper to protect the top.

Nothing to do but move forward, we need to separate them while quaking in fear of damaging the top. Luckily, we find an edge that is not glued together. Using two chisels we *very* carefully work around the perimeter, separating the scrap plywood from the walnut. They come apart but some of the plywood breaks off and sticks to the walnut. Better this than the walnut breaking off. We return to using the chisels to carefully remove the plywood remnants. It takes a little time but it gets done.

Finally, we are on to cutting the bottom of the reader board to size. First to the table saw for a rough cut to 1/8<sup>th</sup> larger than the final size on each edge. Then on to the router with a flush cut bit to do the finish cut. This goes well.

Cal has completed milling down the top of the pedestal. It looks fantastic! The walnut edges we were concerned about came out super sharp. What is needed now is some protection. Cal uses blue tape to cover all of the edges, then he tapes cardboard over the top for additional protection.

The pedestal will stay locked in the cutting jig all taped up. We slide the entire unit aside to make room for other work.

With this success we break for lunch!

Back in the Shop we decide we need to prototype the mortises for the magnets. With Charlie’s special micro-adjustable mortise attachment for his router, this goes quickly. However, we find that with the 1/4-inch router bit we have we can’t cut deep enough. We need a good inch but the bit we have only goes 3/4” at best. So we need to get another bit before we can continue.

It’s time to clean up, milling the pedestal creates tons of sawdust, and we call it a day. Again, we have made good progress. During the week we will get a longer router bit and next week we should be able to finish the magnet assembly phase.

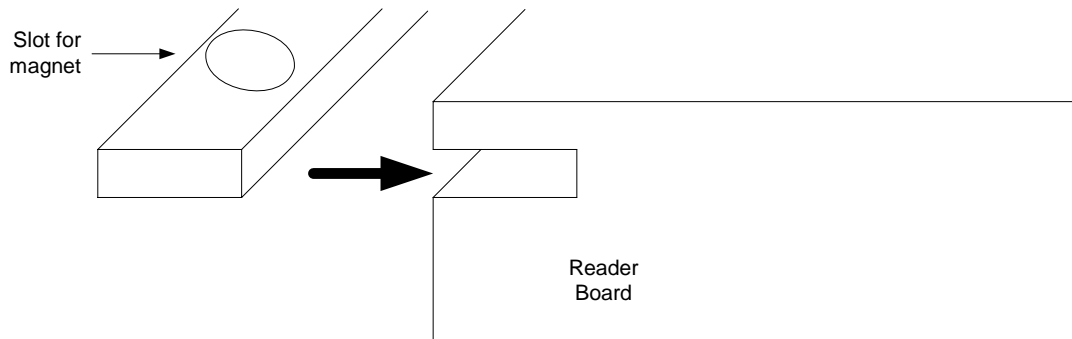
## **Saturday, May 9, 2009**

This morning we attended the memorial services for Lee Wakefield, so we got a late, and somewhat sad, start in the Shop. Just Cal and I today, Charlie is out of town attending a graduation ceremony for his niece.



We focus on the reader board. The first task is to install the magnets to hold the seasonal display banner. We ran into some troubles with the mortised approach so Charlie has an alternative idea:

1. Use the table saw to cut a slot the length of the reader board that is a little over a quarter-inch wide and an inch and a quarter deep.
2. Cut a strip of plywood that will fit snugly into that slot.
3. Use a Forstner bit to remove material in the strip where the magnets will fit.
4. Glue the strip into the slot in the reader board.



This is a much simpler technique. The hard part is holding the big reader board on edge while pushing it through the table saw. But we have a solution from when we had to cut our own veneer on the band saw: a homemade fence that is seven inches high. Clamping this to the edge of the micro-adjustable fence on the table saw gives us lots of support. Add some feather boards and we are ready to make sawdust.

It takes three passes, but we cut a very nice slot across the top of the reader board. Using the micro-adjustable fence made it very easy to get the width of the slot exact.

Next we cut some high-quality birch plywood to act as the insert strip. A few passes on the table saw gets us the correct height, width and depth. It's a perfect fit, in fact so snug that we wonder whether there is any room for the glue.

Next we lay out the center line for the magnets and use the drill press to cut the holes (not quite all the way through) to hold the magnets with their backing washers (these steel washers help focus the magnet lines of force to the top).

More assembly (I love assembly). Using a little brush, put some glue into the slot we cut. Then fit the strip with its magnets into place, a little tapping with a big hammer and board to focus the force, and we are done! One more task to check off the list – very nice.

But we are not finished yet. We want to prep for doing the banding next week, so we need to prepare the wood that we selected long ago. First to the table saw to make some rough cuts. Then we have to set up the planer to get the boards down to the correct width.

We have planed lots of wood on this project so we are experienced setting up the tool. But we have a slight complication this time, Charlie's station wagon is in the way; they took Laura's car for the trip.

Now the DeWalt DW735 is considered a "portable" planer, but at 92 pounds, it's heavy! We don't want to have to carry it far, so some creativity is required for dealing with the station wagon. Not a problem really, we just need to do some creative routing of the big sawdust exhaust hose.



We find a reasonable solution, the routing makes no sharp bends in the exhaust hose and keeps the sawdust out of the shop and work areas. No damage to the car that we can see.



Planning the walnut to the correct width does not take long, then it's back to the table saw to cut the boards to approximate length. We want them to be a little long to give us material to work with when doing the banding next weekend.

This is SO GOOD! The light at the end of the tunnel is noticeably brighter. Time to put the tools away and vacuum up the day's sawdust.



## Saturday, May 16, 2009

Another early start: 10:00am. The primary goal for today is the reader-board binding, but this is really a one-person job and Charlie owns it. So Cal and I will work on the walnut step concurrently. Unfortunately, there is only one table saw!

Cal and I start with picking the wood to be used for the step, while Charlie sets up a work area for doing the binding. Picking the wood requires going through what we have left on the shelf. We find a nice piece from which we can get all the elements if we do it correctly. So we carefully lay out the cutting pattern and make the rough cuts with a hand-held circular saw.

Next we set up the planer and surface the wood. ARG, we only have one table saw. Cal and I take it back from Charlie to square up the wood and cut it to length.

Meanwhile, Charlie has been laying out the biscuit pattern for the reader-board binding. Next he cuts the biscuit slots in both the binding and reader board.

**OOPS!** We seem to have a little problem with the biscuit slots in the reader board. It seems that despite the well-laminated birch plywood, the reader board has a slight bow to it. This has caused the slots to be cut incorrectly. OK, we can deal with this, it's just annoying and is going to take a little time.

Good place to break for lunch.

While Charlie plans out how to correct the issue with the biscuit slots, Cal and I take control of the table saw and make the final cuts for building the step. Most importantly, we need to create the top of the step, about 20" x 14", by edge-gluing two boards. Oh, yes, and use biscuits! All three of us work together on the two boards to be glued: cutting the biscuit slots, applying the glue, clamping it up with three Bessie clamps, and cleaning up the "squeeze out." This task goes quickly, and we set this wood aside for the glue to cure.

Then it's back to the reader-board binding. Working together we find a way to overcome the bow in the reader-board and we re-cut the biscuit slots. This time they are dead on!

But it has gotten late so we decide it's time to stop and clean up. My assignment for the week is to create a cutting template for the arch in the center support of the step: straight-edged boards everywhere looks boring and heavy.

Yet another productive day in the shop. Life is good.

## Saturday, May 23, 2009

It's a 10:00am start again – amazing how motivated we have become now that we can see all the pieces coming together. The plan is to continue work on the reader-board binding and the step.

We start with the reader board by fabricating "filler biscuits" as a way to fill the poor cuts caused by the un-expected bow. We have to make a jig to hold the little biscuits so that

we can cut them in half on the table saw. This takes a bit of doing, but we figure out how to get it done. Cal and I manufacture the filler biscuits while Charlie gets them installed. It all works out very nicely.

Charlie is quickly back to fitting the binding, while Cal and I get to work on the step. First effort is to use the band saw to cut the arc in the center board. The band-saw blade is very sharp and, even with this well-aged walnut, it's like cutting butter with a hot knife.

Next we need to sand the arc and Charlie has just the tool: a Delta SA350K Bench Oscillating Spindle Sander. Its brand new and has never been used. Turns out that some assembly is necessary: where is the users manual anyway? I don't see that part shown in the picture, etc.

It takes a little while but we find all the parts and get it assembled. Then we have to clean up the protective plastic coating on the work surface; mineral sprits and a little elbow grease get the job done. Last we put an anti-rust treatment on the work surface and basic assembly is now complete.

Now we select and attach the large sanding spindle and away we go. It is so nice, a good power tool makes quick work out of sanding the arc in the center support. Very nice, well worth the time needed to assemble (even if we did need to look at the user's manual, and, yes, we did read part of the set up instructions, but we mostly figured it out on our own; the manual was just to double check you understand).

Charlie is still working on the banding. It's a long repetitive process:

- Trim the banding
- Clamp it into place with dry biscuits to check alignment.
- Check alignment with all other pieces.
- Unclamp one piece that needs to be trimmed
- Branch to top and repeat, and repeat, and repeat, and ...

Cal and I want to make a final check to be sure that the step will fit correctly in the base of the pulpit before we glue everything up. This requires that we remove the pedestal from the jig used to mill down the top and place it up on the base.

Disassembling the jig requires both of us and takes longer than we expected. But we don't want to damage the pedestal – so slow and careful is good!

**Blessed Be!** we have the pedestal on the base and it looks really good. We put the reader board on with just the banding temporally attached with dry biscuits. It looks *so* fine. We can hardly wait to see what a finish will do to bring out the wood grain, especially the quilted maple on the front. It's one of those moments where you can see all of your effort paying off.



Enough with the admiration, the Whip says it won't get done unless we just do it, so we return to work. But with renewed energy.

Double checking the dimensions for the step against the actual base and pedestal looks good.

It has gotten late and it's time to clean up and head off to other responsibilities. But life in the Shop is good – there is a lasting glow from seeing all of the elements, even temporally, put together. We are stoked!

## **Saturday, May 30, 2009**

The main focus today is to complete the banding, this is primarily Charlie's job. There is still some tedious work of adjusting the 45-degree edges to get a perfect miter joint.

Dealing with the binding at this point is a one-person job, so parallel work is done on fabricating the step. What needs to be done there is to round over the edges with a router and cut the slots for the biscuits.

The router work is fast but cutting the slots requires lots of careful layout work. This takes most of the morning to get done and double checked.

At last, after much testing, and adjusting, and testing, and trimming, Charlie is finally satisfied with the banding and it's time to apply the glue and the clamps. Work on the step is put aside until later, and we get down to the hard stuff.

The final gluing of the reader-board banding is unnerving, any mistake here will be visible forever. But Charlie and I have done banding together before, so we're not as scared as we would be otherwise. Once we start the gluing, we have to move fast. There is only so much setup time and we have to be really careful. It's been a long morning, so we decide to break for lunch before doing the gluing. We will use the lunch break to talk through the gluing procedure as yet another double check on what is to be done and how.

Time to get it done – glue on the reader-board banding:

1. Dry clamp all four sides in place, with biscuits to triple check that it all fits and to verify we have a workable clamping pattern for all four side.

Don't laugh, the clamping pattern is important: you can get into a situation where the clamps go in one direction and prevent you from putting necessary clamps going in the other direction. So planning the criss-crossing and spacing in advance is important.

2. Remove the clamps that hold the sides of the reader board in place; this leaves the clamps and the top and bottom binding in place.
3. Liberally apply glue to the binding, the body of the reader board, the biscuits and the biscuit slots. Lots and lots of glue! We are all working frantically, the glue has a set time that we can't exceed.
4. Put the first side board into place and align it, using the top and bottom banding boards as reference.
5. Repeat the glue application process for the second side and put it into place.
6. Double check the alignment of the two side binding boards, we still have a little working time on the glue. Then clamp the bejeebers (technical shop term) out of it; we are talking four big Bessie clamps over a 20" span.
7. Wipe up the squeezed-out glue with wet rags. Squeeze out is a good sign as it shows that the glue is fully spread across the entire surface of the joint.

With the two sides glued and solidly clamped in place, we proceed to gluing the top and bottom banding boards. It's the same process, but the span is longer, 32-inches, so we use even more clamps.

Finally, it's done and we come up for air. Doing the glue up has been hard, focused work, and we are emotionally exhausted! We decide to un-plug the equipment and close down the shop. I will come back on Monday to un-clamp the reader board and clean up.

Its been a good day – but a nerve-racking one.

## Monday, June 1, 2009

I am back in the Shop on my own to remove the clamps from the reader board and clean up from Saturday's work.

Despite our efforts to clean up the squeezed-out glue, a little bit under the clamps left bumps. Some quick work with a really sharp chisel takes care of that.

Oh MAN, it looks good! I am eager to get it sanded down but that will have to wait for next Saturday. Put all of the clamps away for now, we used at least 12 of them; then clean up the tools and the Shop in general.

After finishing in the Shop, I call and make arrangements to visit the Grue-Sheridan Studio in San Francisco for the upcoming Saturday. Then I drive down to the hardware store to buy a bunch of sandpaper.

The downside of finishing a project is the "finishing!" This begins with what seems like endless sanding. I hate it! But, at least, we can sand using power tools – this makes it tolerable.

## Saturday, June 6, 2009

The goal for today is to get the reader board sanded using the big sander at the Grue-Sheridan Studio. However, that does not open until noon, so the morning is spent working on the step. Two things are needed here:

1. Cut the pockets for the screws that hold the base to the top of the step.
2. Sand before doing the final assembly and glue up.

We accomplished both easily, though it takes a little while to set up. We are being careful to capture the dust from the sander. We may need to mix some glue with it to create custom walnut wood filler with matching color.

At 11:30 we hit the road for San Francisco. The trip is quick and easy. Once there the process is the same as in January and goes quickly.

Oh MAN, the sanded reader board looks good! Time to head back home for lunch and clean up the Shop. We are stopping early today.

## Saturday, June 20, 2009

We start out by gluing up the step. This all goes very quickly.

**OOPS!** We discover an error in the layout of the feet for the step. It's not centered, and it's off by a noticeable amount. I am at a total loss as to how this could have happened. There must have been too many lines drawn during layout and, at some point, the wrong reference got used. Who knows, at any rate it will be easy to fix once the glue has set but its frustrating to have made the mistake.

Next it's on to putting the trim on the front of the shelves. This involves several steps for each shelf:

1. Mark reference lines to help in aligning the shelf when we put it back.
2. Remove the eight pocket screws from the shelf and take the shelf out of the pedestal.
3. Drill three pocket screw holes in the back of the shelf (to attach to the front of the pulpit) and three pocket screw holes in the front of the shelf (to hold the walnut trim). Drilling these pocket screw holes is not hard but takes several steps:
  - a. Position the pocket-screw drilling jig.
  - b. Attach using the specialized vice grips that comes with the jig, this keeps the jig flat against the surface to be drilled in to.
  - c. Clamp the jig to prevent it sliding away from the edge. In the past we have found that the vice grip is not strong enough to prevent lateral movement, so an extra clamp is needed.
  - d. Drill the hole.
4. Put the shelf back into the pedestal, using nails to help align the existing screw holes.
5. Install the original eight pocket screws.
6. Install three new pocket screws into the back of the shelf
7. Clamp a reference board to the top surface of the shelf such that it hangs over the front edge.
8. Clamp the walnut edge to the reference board, this will ensure that the top of the trim and the top of the shelf align.
9. Clamp the walnut trim against the edge of the shelf to make sure it does not shift.
10. Screw in the three pocket screws used to hold the trim in place.

We follow this process for the top shelf and it works great. Time for a lunch break.

Returning from lunch, we review the experiments that Charlie has done regarding the finish. He has mixed two batches of finish and applied them to the three woods we are using:

- Walnut
- Curly maple for the front
- Maple veneer for the sides and shelves

The walnut and curly maple look fantastic! However, the color on the maple veneer used for the sides of the pedestal are a little too yellow-orange. We talk about the possible

causes of this and what, if anything, can or should be done. Finally we decide to complete work on the shelves and “sleep on” the issues of the finish.

**OOPS!** We start work on the middle shelf and reach Step 4 when I realize I have made a *big* mistake. I drilled the new pocket holes on the wrong side of the shelf. **MEGA BUMMER!** I guess I was distracted by thinking about the finish, so failed to talk through the drilling steps and made the mistake.

Charlie to the rescue – he has a solution! We plug the pocket holes and put a new maple veneer on the shelf to hide the error. However, it has gotten late in the day and I am feeling somewhat discouraged by my error. So we decide to stop. I will clean up the Shop later.

That evening, I stop by the WoodCraft store on Industrial Road and pick up the supplies. Charlie is in the Shop Sunday evening working on some other tasks so I take the opportunity to glue the pocket-screw hole plugs into place.

## Monday, June 22, 2009

I really want to finish the walnut trim on the shelves. Charlie’s solution to my OOPS on Saturday is easy so I head down to the Shop on my own and start trimming the pocket-screw hole plugs level with the surface of the shelf.

However, gluing on the veneer is a two-person job. Fortunately, Cal is free and comes by to help. We finish preparing the shelf with a quick sanding, then we put on some glue, apply the veneer (which immediately starts curling), load a few hundred pounds of floor tiles on it and leave it to dry.

Cal and I then set up the saw and cut the step so that the legs are centered. A quick pass with the router with an 1/8<sup>th</sup> inch rounder over bit and the shelf problem has been corrected.

On this note of success we break for lunch.

Returning from lunch, Cal and I review Charlie’s finish samples and have a short discussion about color. Cal has a meeting so he takes off, and I set to work finishing the shelves.

Using the above process, I am able to quickly do the bottom shelf without problems.

Then I return to the middle shelf. The glue has set, now I have to trim the veneer to the shelf. Easy with an X-Acto Knife and a





sharp chisel. Not only do I have to trim the edges; but also the slots that the page dividers sit in. Not hard but it takes a little time.

After that, I reinstall the shelf in the pedestal and attach the walnut trim.

Now the pulpit is where I wanted it at the end of work Saturday. Time to clean up the Shop, update the punch list, update the Book of the Pulpit and call it quits for the day.

## Thursday, July 02, 2009

I have the time, so I spend the afternoon in the Shop counter-sinking the sockets for the light and microphone in the reader board. Most of this is hand work with super sharp chisels, but it's harder than that because the sockets have rounded corners. To do the counter-sink, I used the following technique for each socket:

1. Cover the area with blue tape to get a better definition of the edge.
2. Put the socket in place and, using a scribe, cut around the edge of the socket. The corners of the sockets are rounded so this takes extra care. The cut must be deep enough to cut both the blue tape and leave a clear scribe-line in the walnut.
3. To get the rounded corners correct, I pick a brad-point drill bit with a matching radius to the rounded corners of the sockets. Then using the drill press, with the depth set to match the thickness of the socket bezel, I drill out each of the four corners.
4. Remove the blue tape and begin working with a very small, very sharp, chisel.

It only takes a few hours but it's good to have it done.



## Saturday, July 04, 2009

The goal for today is to build and install the retaining shelf used for holding the reader board. The space the shelf fits into is complex with lots of changing-radius curves. The saving grace is that no one will ever see the mounting shelf, so we don't have to be as exacting as with the other shelves.

I start early making a press-board template for the shape. We'll use this to draw an outline on the stock from which the shelf will be constructed.

When Cal arrives, we use the table saw to make a rough cut, then use the band saw to cut the curve. The curve changes from one end of the board to the other; and from the top surface to the bottom surface. We used the press board template to draw lines approximating the different curves then started working with a hand rasp.

Charlie's tools are good, and the rasp cuts through the dense birch plywood quickly. So what we expected to take a long time, went surprisingly quickly.

Next we have to drill 22 pocket-holes to attach the mounting shelf to the sides and front of the pedestal. The pocket hole jig does two holes at a time, so this also takes less time than we expected.

The next task is to figure out where to drill the eight holes for mounting the reader board. The concern here is that we not drill into the reader board channels that will contain the wires for the microphone and light.

We need to figure out where to drill the access hole for the microphone and light cables so that it matches the corresponding hole on the bottom of the reader board (the big dot at the top of the picture). We also figure out the routing of the wire channels (the lines come off the dot at angles).



The result is that we will drill the mounting holes between each set of pocket holes. But we will leave that for next week. Having a plan, we decide to screw the mounting shelf into place and double check all our alignment marks. It fits nicely!

Now, time to do a little planning. We have come up with a way to clamp the reader board to the pedestal and get it aligned correctly. We also decide how to mount the sockets needed for the wiring.

Enough for one day. Life in the Shop is good!

## Sunday, July 05, 2009

We are so close to getting the reader board mounted that we decide to put in a few hours today and see if we can finish that part of the project. So after church I drive to the hardware store and buy 3/8" x 2 1/2" lag bolts along with nuts and star lock washers.

In the afternoon, we screw the rest of the pocket screws onto the reader board retaining shelf and mark where we want the six lag bolts to go for mounting the reader board. To drill the holes for the lag bolts through the mounting shelf, we use another of Charlie's nifty tools. A hand drill mounted on a special base so that it stays perpendicular to the drilling surface. This tool, plus a nice sharp brad-point bit, makes drilling the six holes easy.

Then we put the reader board back on top of the pedestal. The trick here is to clamp two alignment blocks to the reader board that rest against the front of the pedestal and take care of the front-to-back alignment. This leaves only the left-to-right alignment to be done by hand, eye actually, using center-line marks we drew on the bottom of the reader board and top of the pedestal. We have a special four-step process for getting the alignment blocks clamped in exactly the correct place every time – but that's a Shop secret.

We put the reader board back on the pedestal, align it, and use the same brad-point bit to transfer the center point for each of the mounting holes we drilled from the retaining shelf to the bottom of the reader board. This is the really critical step in the process. It defines how the reader board will sit for all time. We check everything twice as we don't want an occurrence of the word which must not be said but starts with "O".

Transferring the mounting points goes well. We remove the reader board and take it to the drill press to pre-drill the holes for the lag bolts. Again, we triple check our settings for the depth of the lead holes, we don't want to damage the top surface. No Problem! We get the six holes drilled in no time.

We also remove the retaining shelf and take it to the drill press so that we can make the 2¼" hole for the microphone and light wires to pass through. Just to be rigorous, we get out the router and the 1/8" round-over bit to take the edges off the hole for the wires.

Time to assemble and see if it all comes together. We pre-sink the lag bolts into the reader board to make it easier once it's in place on the pedestal.

YES – it's so nice when a plan comes together!  
Life in the Shop is good!

## Monday, July 06, 2009

The upside of being unemployed is that I have extra time to spend in the Shop. Sadly, I have to do this solo, but good progress can still be made. I have three mounting blocks that I need to create and attach for the electronics:

1. A block for connections between the reader board and the pedestal.  
Microphone and power for light.
2. A block for holding the dimmer for the lamp.
3. A block for holding the sockets connecting the pulpit to the sound system and power for the light.

So I go to work. The only tricky part is that the socket for the lamp power is small and designed for mounting into metal. But I want a wood mounting block, so I have to drill partial holes of several different diameters to deal with the thickness of the wood and creating clearances for the connections.

## Friday, July 10, 2009

I am back in the Shop on my own to do a little work to finish up the mounting blocks for the electronics. The edges need rounded-over holes drilled for attaching to the pedestal. The alignments are tricky with curved and slanting surfaces. I had one small OOPS, but it was easily corrected – don't tell anyone!

## Saturday, July 11, 2009

All three of us are in the Shop today.

Charlie is focused on fixing dents and flaws in the wood. He has come equipped with his iron and sandpaper. This is tedious work, but Charlie takes it in stride.

Concurrently with Charlie's work, Cal and I work on creating mounting cleats for attaching the pedestal to the base. I drew a design on paper and all three of us review the design and talk through the steps for fabrication. After double checking everything, it's time to make sawdust.

The tricky part is matching the angles on the interior pedestal sides to the cleats. This takes a little trial-and-error, but that is why we make prototypes. Once we have the angles correct, cutting the wood goes quickly.

Next we have to pre-drill holes for attaching the cleats to the pedestal and to the base. The base is not too hard. Two big bolts (we are talking 3/8" here) for each of the sides and three of them across the front.

Connecting the cleats to the pedestal is another story. The sides and front of the pedestal are not very thick, so we are going to have to use lots of small screws. Fortunately, Charlie has a nice drill press. We prototype the holes; we want to set the stops correctly so that we don't drill too deep, and then we start drilling. Nine holes for each side and sixteen for the front. The question is: are 34 screws enough?



We mount the cleats to the bottom of the pedestal and we are done for the day.

## Sunday, July 12, 2009

We really want to finish attaching the pedestal to the base so we are back in the Shop following church services today. We have a few simple tasks:

1. Align the pedestal on the base.
2. Transfer the position of the seven mounting holes.

3. Drill the mounting holes into the base.
4. Put in the big double-threaded bolts into the base. These 3/8" bolts have a machine thread on one half and a wood thread on the other.
5. Assemble the base and pedestal.



## Wednesday, July 15, 2009

Like horses that can smell the barn, we are on the move. This evening we cut the slot in the reader board for the brass page-holding bar. There is only one more thing left to do before assembly is complete: A bit of walnut trim is needed to hide the reader board retaining shelf.

## Saturday, July 18, 2009

Two goals for today:

- Cut walnut trim for the reader board retaining shelf.
- Plane down the walnut trim on the shelves – when we installed the trim it sat proud of the walnut rails at the back of the pedestal.

Each task only takes one person so I cut some walnut trim while Charlie works on planing the trim on the shelves.

Working with a hand plane is hard, the blade has to be super sharp and the bottom of the base has to be flat and smooth. Any little problem and you risk the blade catching and nicking the wood, leaving a deep scar. We do not want any scarring.

We don't use hand planes often, so the first step is to get Charlie's small hand plane into shape. Fortunately, Charlie has a "dry" sharpening tool that will do the trick. First we flatten and polish the bottom of the base; then we sharpen the plane iron. As with sanding, you have to move from high abrasive grits to finer and finer grits. It takes time.

But once done, the results are very nice. Charlie makes one long pass with the plane on a test board and we get this lovely long thin curl of walnut. YES – the plane is ready for the shelf trim.

It only takes a few passes and the shelf trim is brought almost level with the banding. VERY NICE.

Concurrently with Charlie's efforts, I have been working away at the table saw cutting the trim. This is not simple as there are several compound angles that have to be matched. So I start by measuring each angle and cutting prototypes to verify the measurements.

Next we pick some walnut stock to work from and start cutting. This is a small piece of trim, so part of the problem here is coming up with ways to hold the wood securely while running it through the table saw and protecting the fingers! Thank goodness Charlie has lots of small clamps. It does not take long to build a jig to hold the work piece while cutting.

All of this work takes time, but it gets done. In finishing and installing the trim of for the reader board retaining shelf we reach a major mile stone:

### ***We have completed assembling the Pulpit!***

What is left? Sanding and finishing. This is going to be lots of work, but the end is in sight. We have a goal – Finish the pulpit by the start of the new church year in September. This means it can be used for Charlie's wedding and Bill Kennedy's ordination.

Life in the Shop is good!

## **Monday, July 20, 2009**

If we are going to get the pulpit done, some additional effort is needed. So I spend several hours today sanding the back walnut rails on the pedestal. Because the rails are curved, this is all hand work. Additionally, I have to remove a fair amount of walnut to get it level with the maple sides, yet without actually sanding the maple.

The maple veneer on the hand-made plywood (see entries for September 2005) is very thin over a base of dark-colored plywood. Sanding through the maple veneer would be *very* bad!

I go to the walnut scrap box and find the curved pieces from which we originally cut the walnut rails. These I cut down to form sanding blocks that will approximate the curve of the pulpit sides. Then I spray the curved surface with contact adhesive and apply some 100-grit sandpaper.

This works great! Adhering the sandpaper to the sanding block allows me to focus on controlling the block without having to worry about the sand paper slipping. Another one of Charlie's tricks pays off big time.

The walnut is very dry and the sand paper cuts through it quickly. But concern for not sanding the maple veneer takes precedence. So I only take the walnut down about half way before switching to the 120-grit sand paper. Take it down half more again, then switch to the 150-grit sand paper. Take it down another half and switch to the 220-grit sandpaper. This I take down to where it is almost even with the maple, the difference in levels is just barely perceptible to the touch.

Time to switch to the 320-grit sand paper and make the final pass. It has taken me about three hours but the hand sanding of the rear walnut rails of the pedestal is complete.

## **Tuesday, July 21, 2009**

Today more sanding, but with POWER TOOLS! Well, mostly power tools. The front walnut rails of the pedestal have to be sanded by hand, but there is much less wood to be removed so this will be quick compared to Monday.

First task is to use the DeWalt Random Orbital Sander to sand the:

- Reader board
- Cleats for the base
- Mounting blocks for the electronics and connectors

Working through all the grits 100, 120, 150, 220 goes quickly. Again the sandpaper quickly cuts the dry walnut.

Next it's on to sanding the pedestal. I start with the side edges of the front walnut rails that require hand sanding, then the front edge of the rails and then the curly maple veneer. Recall that we made the curly maple veneer ourselves (see entries for July 12, 2008) so that it will be extra thick. So the curly maple veneer can be sanded in the same way as the walnut rails. I use the power sander in this case and the sanding goes quickly.

It takes me about four hours, but the work is done. Most parts of the pulpit are sanded and ready for finishing. What is left?

- Finish planing the walnut trim on the shelves.
- Remove the shelves and sand them.
- Sand the interior of the pedestal.

The "plan of record" for Saturday, is for me to finish this sanding while Charlie starts applying the finish.

## **Saturday, July 25, 2009**

It's a very big day in the Shop. During the week, Charlie has been working in the evenings to formulate the finish we are going to use for the pulpit. It has taken four experiments but we have finally found the finish we like. Today we start the application.



I wish the application was simpler but we need to finish each piece separately, so my job is to start disassembling the pedestal. The base, reader board, and step are ready for finishing so Charlie starts on those.

It's hard for me to keep focused on removing the shelves from the pedestal, I keep wandering over to where Charlie is applying the first coat of finish to the walnut. The finish brings out the color and the grain – it's so different than the raw wood, it's so beautiful.

Our goal is to get the first coat of finish on everything except the exterior of the pedestal. So we work a long day. Starting at 10:30am and continuing, with only a short lunch break, until 6:30pm. We are exhausted by the end of the day, but the wood looks so good with the finish that we are ecstatic.

Charlie will return to the shop every night this week and put on another coat of finish. Next Saturday we will start work on finishing the exterior of the pedestal. The goal is to dedicate the pulpit Sunday, September 13.

With the Pulpit disassembled, it's a good time to review all the final elements:

Here are the three shelves. Note that the walnut trim has been removed.

- Top shelf – upper right
- Middle shelf - upper left
- Bottom shelf – bottom left

The picture shows the “up” side of the shelves. The “down” side is where all the pocket screws that hold the shelves in place are located.



Here is the pedestal, lying face down so that the inside can be finished. At the top you see the reader board retaining shelf that is still installed. The hole in the shelf is where the wires from the reader board will feed down and get connected.



This is the base; actually the bottom of the base, the top has much nicer walnut.



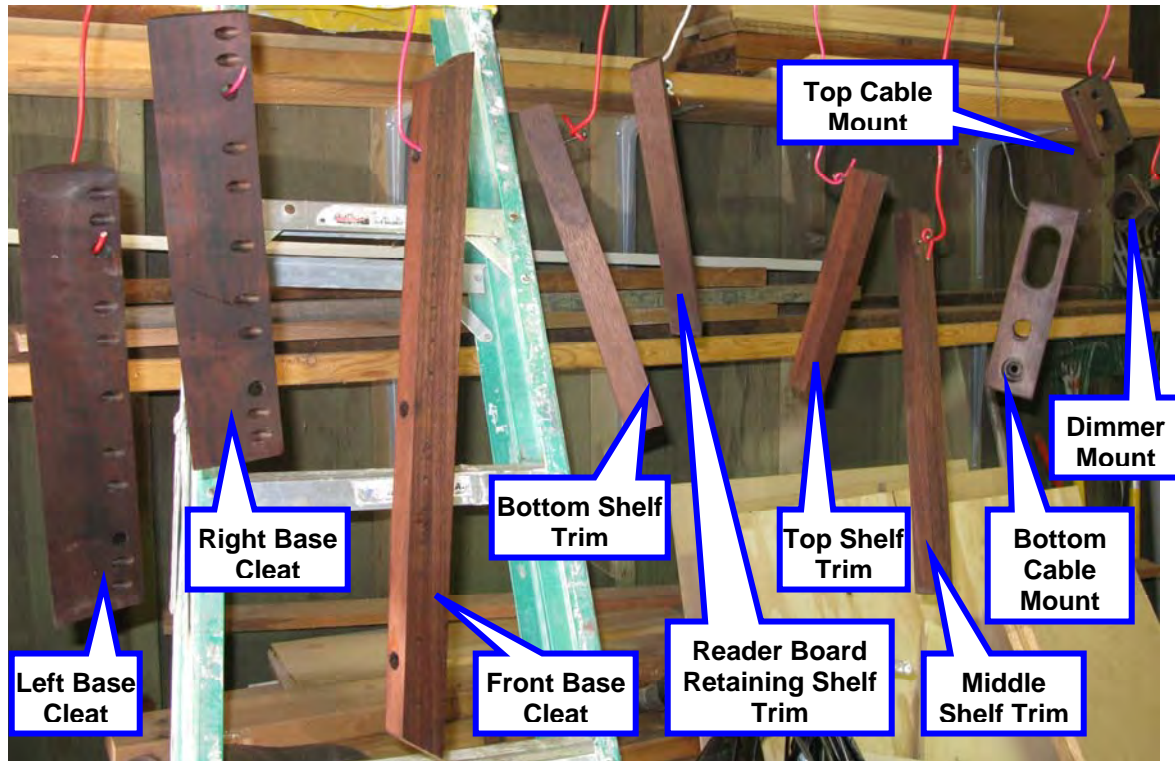
Here is the reader board. You can just make out the sockets for the microphone (upper left) and the light (upper right). Across the bottom is the slot that the brass page-holder bar fits into.



This is the step that will sit inside the base so that it can be easily pulled out as needed or pushed back in as needed.



There are many, many little bits of walnut used to trim out and hold together the entire assembly. To make finishing easier we hang the small parts from the ceiling by wires:



## Charlie on Finishing

In selecting the finish to use on the pulpit, we considered both oil and varnish. Although both produce a pleasing finish to the wood, they differ in several respects. Varnish dries to a more durable finish that provides more protection than oil but it is harder to apply, sometimes resulting in sags, runs, brush marks, or dust embedded in the finish. Also, too thick a coat of varnish can give the feeling of looking at the wood through a film of plastic. Oil provides a more natural-looking wood finish and is very easy to apply. However, it does not provide a lot of protection to the wood. In light of these differences, we decided to use different finishes for the interior and the exterior of the pulpit.

For the interior of the pulpit, we used varnish. We wanted the protective clear coat that that varnish provides, in order to protect from damage caused by spills and minor abrasions. We wanted to avoid having to disassemble the pulpit to make repairs, so we wanted a stronger finish to minimize the damage the would be done during normal usage. To get around the difficulties inherent in applying varnish, we used a wiping varnish, which is simply a thinned varnish. Wiping varnish goes on in thinner coats than regular varnish, making it much easier to avoid sags, runs, and brush marks, and dries much more rapidly than regular varnish, attracting less dust. Since each coat of wiping varnish is thinner than regular varnish, more coats are necessary to achieve a given level of protection.

For the exterior of the pulpit, we used an oil and varnish mixture. Adding oil and varnish together bring out the figure of the wood in a more dramatic way than varnish alone. The mixture provides more surface protection than oil alone but still provides a very natural looking wood surface, not running the risk of creating the plastic film appearance that varnish can produce. Because of the lower surface protection, an oil and varnish mixture is more easily damaged but is much easier to repair and restore than varnish alone. Furniture that gets used regularly gets damaged during normal use, incurring scratches, dings, and other minor damage. Consequently, the ability to repair and restore the finish on the outside surfaces of the pulpit was important to us.

Once deciding on the finishes to use, we had to decide which type of oil and which type of varnish to use.

We decided to use a type of varnish called "spar varnish", which is a long oil varnish, that is, a varnish containing a relatively high proportion of oil mixed in with its resins. Long oil varnishes remain more flexible than short oil varnishes such as polyurethane, making it easier for a new coat of finish applied to a damaged area to adhere to the existing finish. Spar varnish, which is formulated to withstand use in outdoor applications, is tough, long-lasting, elastic and waterproof. It also contains substantially higher amounts of UV-absorbers, which slow the color changes produced in wood by exposure to sunlight. The first spar varnish we tried was McCloskey Man O' War Spar Varnish. We created two different oil and varnish mixtures: one made with tung oil and one made with linseed oil.

The exterior of the pulpit has three kinds of wood: walnut, quilted maple, and maple. When we applied the oil and varnish mixture to samples of the three types of wood, we found that both test finishes imparted quite a yellow tone to the maple that was very unharmonious with the other two woods. The yellow tone was the result of the amber color of the varnish. All oil-based varnishes have an amber tint to some degree, but some varnishes are made with materials having less of an amber tint than others. We found a product called "Behlen's Water White Restoration Spar Varnish" that has an extremely pale color. Again we created two different oil and varnish mixtures: one made with tung oil, and one made with linseed oil.

The finishes made with the Water White varnish did not produce the yellow tone produced by the first two finishes tested, so we focused on the differences between the appearance produced by the two oils. Linseed oil generally results in a darker finish than tung oil. In the samples we created, though, the difference was more subtle than expected and more subtle than I have seen on other occasions when I used this finish. Despite the subtlety of the difference between the oils, we definitely preferred the tung oil over the linseed oil. So our final choice to finish the exterior of the pulpit was Water White spar varnish mixed with tung oil.

We applied nine coats of wiping varnish to the pulpit interior over the course of a week (each coat dries very quickly) then let it cure for a week, after which we leveled the surface with fine-grit sandpaper, and rubbed it out with steel wool and rottenstone. We applied five coats of oil and varnish finish to the exterior of the pulpit. We applied each coat by brushing liberal amounts the finish on the surfaces of the pulpit, allowing the

finish to soak in and begin to get tacky, then wiping the surfaces clean. After giving the finish some time to cure, we rubbed it out using steel wool and a mixture of beeswax and tung oil.

## Saturday, August 8, 2009

Four big accomplishments on the pedestal today:

- Complete the inside finish.
- Install the electrical components .
- Install the shelves.
- Complete sanding the exterior of the sides.

It got a little tricky at times with each of us working on different tasks all focused on the pedestal.

In the morning, Charlie finished rubbing down the first shelves to be installed and then worked on the interior of the pedestal. This final step of finishing has four phases and must be done carefully lest too much of the finish is removed.

1. 600-grit wet and dry sand paper is used with water as a lubricant to take down the “dust nubs” from applying the finish.
2. 0000 steel wool to remove the high gloss.
3. 0000 steel wool, rottenstone and mineral oil to create the final finish texture.
4. A heavy coat of furniture paste wax as a final layer of protection.

Cal joined Charlie completing the interior of the pedestal. When there was not enough room for them to work together, Charlie switched to finishing the shelves.

While Cal and Charlie worked on the pedestal, I got out of the way by doing the electrical tasks in the driveway:

1. Lay out all of the components and mounting blocks.
2. Measure and cut the lengths of wire and XLR cable.
3. Prepare and tin the ends of each of the wires.
4. Do some initial soldering before mounting.



As soon as Cal completed the interior finish, he helped me install the mounting blocks for the electrical connections to the reader boards and the light dimmer. While I installed the components and completed the soldering, Cal installed the bottom shelf so that I could install the last electrical mounting block.



Then I soldered the connections and installed the bottom mounting block. Then it's time for testing with some dummy input cables and a digital multi-meter. There is a moment of panic when testing one of the circuits for the light, the resistance is way too high! Then I recall that there is a potentiometer in that part of the circuit so the light can be dimmed. No worries – all the connections are fine for both lamp and microphone.

Concurrently Cal finished installing the shelves and their walnut edge trim.

**OOPS!** Something is not quite right. Before we removed the shelves for finishing, the walnut edge trim sat flush with the top surface of each shelf and was snug and flush with the rear walnut rails. But things are not lining up as well on the bottom two shelves. The reader board retaining shelf and top shelf are good, but what is going on with the other two shelves? ARG!!!

It's late, we have been working from 10:00am to 4:30pm and, except for the issue with the two lower shelves, we have accomplished all of our goals. I will come back during the week and see what I can do about the two shelves. It's probably something simple, maybe the pocket screws were not torqued down in the correct order. But it will have to wait, we are too tired.

## **Week of August 10, 2009**

I am still unemployed, so I am able to come to the Shop on weekdays and make additional progress working on the shelves.

I had to remove the two lower shelves and remount them. I also remounted the walnut trim to get a better fit. It took some hand sanding, but it's done and it looks good.

While I have been working in the Shop during the day, Charlie has been layering additional finish on the base, reader board and step in the evenings after a day at the office. The nice deep, dark, finish is wonderful to see.

Because these elements will get the most wear, Charlie is putting in extra time to get as many layers of protective finish on them as possible. It looks so good now, I can hardly wait until we put the final coat on and do the final buffing.

Life in the Shop is good, even on weekdays!

## **Saturday, August 15, 2009**

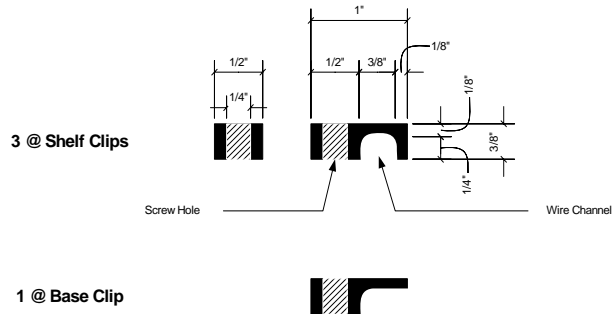
The primary focus is putting the finish on the exterior of the pedestal. Work on the Base, Reader Board and Step has been moving along steadily, but the exterior of the pedestal has been waiting for the interior to be finished and to patch some blemishes (noting more will be said on this point – don't ask, and don't go looking).

To do the patching (filling seams in the veneer, etc.), we need to make a paste out of fine sawdust from the same wood as the piece to be patched. So the first task for this session is to use the sander to make a bunch of fine sawdust. We take turns running the sander over some left-over pieces of the curly maple we used for the front and the clear maple

we used for the sides. Then we carefully collect this very fine sawdust into zip-lock sandwich bags.

The second task is building four brass retaining clips for the wiring. During the week I bought some brass stock from Allen Steel and we cut and filed four pieces needed for the clips.

Even though brass is a relatively soft metal, it takes a surprisingly long time to work it with hand tools. While Charlie has nice power tools for wood, metal is not something the shop is equipped for. So its back to the hand hack saw and hand files to work the brass.



At least we have a drill press for making the holes and removing the material to make the wire channel.

**OOPS!** The bit breaks while drilling the pilot holes in the brass. Very frustrating! It's late and I will have to come back to this task during the week.

## Week of August 17, 2009

More work during the week. Charlie continues finishing in the evenings. He needs more sawdust so I spend some time with the sander making this. It's simple, mindless work that provides a form of meditation.

Not so satisfying are my efforts to finish the brass wire clips. I broke another bit before getting one of the four blocks properly drilled. It's very frustrating. I think that the less expensive drill bit index that I bought awhile back for household tasks is just not up to real metal work. I have a few options:

- Cut some new brass parts (the damaged ones can't be re-used) and buy higher-end drill bits.
- Find an alternative solution to making my own clips.

Well, I have to go out to the hardware stores for some other tasks so I will look around to see whether there is something that I can morph into wire clips. If not, then I will have to purchase some new drill bits and start again. Well, at least, I will have some new tools!

## Saturday, August 22, 2009

I am off on a family trip to the California Railroad Museum in Sacramento, so Cal and Charlie are holding down the Shop.



Charlie is patching the seams in the Curly Maple veneer. These joints between the book matched panels used to be very tight, but they've opened up in some places and need to be patched. Unfortunately, this is not working out very well so Charlie is trying multiple prototypes to get the best formulation.

Cal, on the other hand, is working on the brass page holder and base wire clip (the only one I was able to successfully drill and cut). He does lots of filing and polishing.

## During the Week

I have found an alternative to the wire retaining clips: small black plastic wire clamps used for holding coaxial cable. I had to buy the ones designed for hammering into masonry so that I could yank out the big masonry nail and replace it with a small brass screw. They work very nicely, another minor problem solved.

Charlie continues his nightly pilgrimages to the Shop after returning from his employer's offices. The more layers of finish he puts on the walnut components, the better they look. The color and grain just keep getting deeper and deeper in apparent texture while being smooth to the touch – amazing.

We have also solve the problem of patching the seams in the Curly Maple veneer. Charlie found a formulation that worked and applied it. I came in the next day and sanded the entire front surface smooth again all the way up to 320-grit. This allowed Charlie to start applying finish to the pedestal.

## ***The Book of the Pulpit***

While Charlie has been working on applying the finish, I have been trying to complete the ***Book of the Pulpit*** in time for the Sunday, September 13, 2009, Dedication. There are three big tasks to complete:

1. Finish the composition.
2. Proof and correct.
3. Print:
  - a. Submit a huge PDF file.
  - b. Print a one-off proof copy.
  - c. Make more corrections.
  - d. Submit the final manuscript.
  - e. Print it – how many copies?
4. Distribute the book.

Getting the book printed by a commercial printer has me spooked but I have received a little help with that from our church community. Peter Hartzell knows a printer:

Christopher Edwards  
Infinity Press, Inc.  
871G Industrial Road  
San Carlos, Ca 94070  
650 595-2200

Chris is willing to act as a broker and help me get the book printed. He has located:

The Pea Press  
1100 Industrial Road, Unit 16a  
San Carlos, CA 94070  
Tel: (800) 285-2864  
Fax: (650) 595-8652

The production time-table is very tight, as a compromise I agree to take the one-off proof copy to the Dedication, but even so the schedule is tight:

- Monday: Take test PDF to Chris for review. We want to make sure the formatting and data transfer mechanisms are all correct before printing the final manuscript.
- Tuesday: Submit manuscript for one-off proof printing.
- Friday: Receive one-off proof copy for review and showing at the Dedication.

**ARG! ! !** So much work and so little time!

The Book was written using an old version of Microsoft Word. I had to break it up into multiple files just to make it workable. Even so it's a pain, and I have a hard deadline. Kaye gives it an initial proof reading and does the "production" work needed to supply Chris with a single PDF file.

## **Saturday, August 29, 2009**

More work applying the finish to the pedestal. Charlie, helped by Laura, has been putting in long hours over the past week working both in the morning (before going into the office) and evenings. The layering of the finish takes time but each new application seems to bring out more of the color and texture of the wood.

I have been sneaking down to the Shop in the afternoons to watch the progress and can see the change on a daily basis. This is a process of "elbow grease:"

1. Apply finish.
2. Let it stand.
3. Remove excess finish.
4. Let the finish dry.
5. Rub down the surface.
6. REPEAT, Repeat, repeat ...

While Charlie has been working on the finish, I install the new wire holders for the audio and lamp wiring. Working down inside the pedestal with the shelves installed is a real pain. I can only get one arm into the area at a time and that is making it very hard to get everything in place and then screw it all down.

But when it does come together, it is very nice. I decide to replace the wire staples I used on the reader-board retaining shelf with the new plastic wire clamps. This is easy and goes quickly. A nice reward after fighting with installation inside the pedestal.

During the week Cal and I have also been gathering the materials needed for the final assembly. We can see the light at the end of the tunnel, and I don't think it's a train.

## **Saturday, September 5, 2009**

Charlie and Laura finished applying the oil and varnish mid week and it has been setting up for several days. This setup time is the second-to-last part of the finishing process, today is the final rubout and the finish will be complete.

Rubout is done with a special mixture of beeswax and the oil and varnish finish. This mixture puts a nice wax finish on the wood and, at the same time, the oil and varnish can "improve" any scratches or imperfections that may develop over time. Yes, this wax mixture will go with the pulpit to the church to be applied on Work Days to maintain the wonderful finish on this pulpit.

Charlie gets the reader board done first so that I can start installing the sockets and wiring for the microphone and light. The finishing process left all kinds of smutz in the counter-sunk openings for the sockets. So my first task is to go in with a very small chisel and clean it all out.

Cleaning out the smutz is not hard, but it is nerve racking. The finish on the reader board is so fine, I constantly fear that I will slip and damage it. We take all kinds of extra steps to try and protect the surface. It looks sort of like a photograph of a hospital surgery: The work area has been carefully taped off; soft clean cloths cover everything around the taped-off area; thin trays on the soft cloth hold the tools; hand-held Shop lights ensure good visibility. All this to scrape out some smutz! The setup takes almost as long as the work.

But the work is done with no damage to the surface, and the preparation also protects the reader board during the process of soldering the wires to the sockets and "ohming" out the solder joint (checking for a good electrical connection). Then we pre-drill the holes for the mounting screws, and the socket is put into place.

That completes the socket for the microphone. I carefully remove all of the surrounding protection, then do it again around the socket for the light.

By this time, Charlie has finished rubbing down the pedestal so I install one brass wire clip for holding the microphone and light wires as they leave the back bottom right base cleat of the pulpit. I do this quickly with the cleat installed by drilling the pilot hole from the bottom. It works, but something seems not quite right, perhaps it's good enough.

We are ready for final assembly on Monday: Labor Day.  
Life in the Shop is good!

## Monday, September 7, 2009

Final assembly time. We don't know what problems we will have today but we are convinced that something is going to go wrong, so we gather at 10:00am and talk through the day's tasks.

First, redo the brass wire clip installation. Hand-drilling the pilot hole was not a good idea as the screw went through the big block of walnut at an angle that causes the brass clip to lean awkwardly.

So we remove the cleat (only about nine screws), and use the drill press to drill a new hole. While we are at it, and have the cleat removed, we might as well use a bigger screw to make it all stronger.

We screw the wire clip into the cleat using some finishing wax as a lubricant. We certainly do not want this big brass screw to break off inside the cleat (brass is pretty but not as strong as steel). All goes well and the clip sits flat.

We re-attach the cleat, double-check the screws on the other cleats, and it's time to attach the pedestal to the base. We are terrified that we will break or damage something, so we take the time to talk and walk through the process of lifting the pedestal, moving it through the Shop, and putting it down on the base while carefully aligning the seven large retaining bolts.

Putting the pedestal on the base goes smoothly. We are feeling good and double check the joint where the pedestal meets the base. Expletive, they don't match! What is going on? What is going on, is that we had been building the pedestal on the assumption that the base, made years ago, was FLAT. Well, it's not!

In hindsight, we should have taken the base up to John Grue-Sheridan's Studio and made sure it was flat. But we did not, so now we have to cope. We need to hand-sculpt the bottom of the pulpit to match the base. Good thing we started the day early.

Doing this sanding is a two-person job, so while Cal and Charlie work carefully on this, I start a major Shop clean up. We plan to finish assembling the pulpit today, but a job is not really done until the Shop is clean and the tools put away. After years of working on this project, lots of detritus is lying around that needs to be addressed, not to mention all of the newspaper and plastic we put down to protect surfaces during the finishing process. So I put on my grunt hat and get to work:

First, what to do about the graveyard of templates and jigs?



And all the scraps we have been saving?



Everyone in the shop is busy – but there is a noticeable level of stress in the air. We had expected problems, but not problems with fit. We had been very, very careful while constructing the individual parts so this is a surprise.

Charlie and Cal finish sculpting the bottom of the pedestal and it fits much better. We do the assembly using lock-tight on the retaining bolts so that we don't have to worry about them becoming loose, or someone in the future accidentally tightening them a little too much.

Time to break for lunch. We need to relax before attaching the reader board to the pedestal. We make it a quick lunch, we have more work to do and it's already past noon.

Does the reader board fit perfectly? NO! We have more fitting problems, just as we did with the base. We are really baffled about this. We were so careful about milling the top of the pedestal and we ran the reader board through John Grue-Sheridan's humongous sander. The previous test fittings showed a few problems but not to this degree.

Well, it is what it is and we have to move forward. Cal and Charlie turn to hand-sculpting the top of the pedestal with sandpaper. I set to work building a long low-voltage extension cord for powering the lamp and attaching it to the XLR cable we have been using up on the chancel.

My electrical work goes faster than the sculpting; I have to do *something*, the tension is too high, so I return to cleaning and organizing the Shop. Part of cleaning a shop after a job is to leave it in a better state than when you started. A side effect of using your tools is discovering those you could not find when you needed them. You tuck this information away for the final clean up and try to get things a little better organized and this is what I started doing. Some progress is made:





Charlie and Cal have finished sculpting the top of the pedestal and the fit is much *much* better. It is late and we are all very tired. We lay out all the hardware, review the procedure, put the reader board in position, and crank down the six lag bolts that hold it in place.

### **Assembly is DONE!**

Time for photographs.

With the pressure off, we are having a little trouble settling down. It takes some effort on the part of our photographer to get us to stand still long enough to actually take a picture of the proud parents.







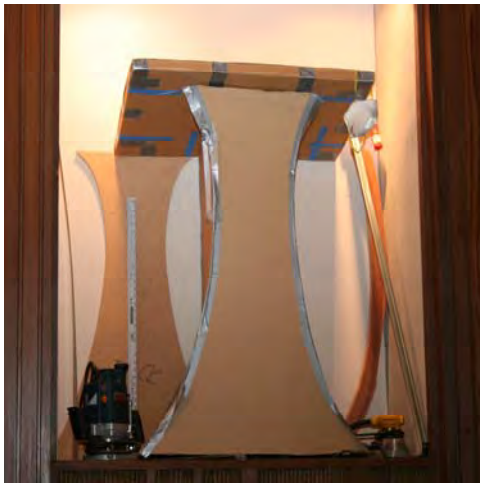
## Saturday, September 12, 2009 @ 7:00pm

Today we move the completed pulpit to the church. The annual rummage sale takes place during the day so we need to wait and make sure all the rummage is cleared out and the place is empty before delivering the pulpit. We carefully load the pulpit into the back of Cal's Explorer hybrid. Cal drives while Charlie rides shotgun making sure the pulpit does not shift during transport.

Now is no time for an **OOPS!** Hard-won lessons have been instilled in us, so we rehearse how we are going to lift, move and pack the pulpit. We run through it twice then load the real thing. No problems! It pays to be careful.

I follow Cal and Charlie to the church in my car with the step and other stuff we are going to need. Once there, we repeat our process of talking through and then practicing how we are going to unload and carry the pulpit. Once again, no problems! Yes, it pays to be careful.

We setup the Pulpit and hide it with a sheet. You can see its shape but just enough to create some suspense. We put Reverend Julia's box on top of it with her message about don't mess around or "I will hunt you down and it will not be pleasant!"



Then we rehearse the presentation that Cal has written. When we are relatively confident that we will look like we know what we are doing, we set up the Center of Interest.

Now we are done and its time to head home. Tomorrow is the big day.

## Sunday, September 13, 2009 – Dedication

During morning services, we present the pulpit to wild acclaim and Reverend Julia performs a moving dedication.

*See the Dedication chapter in the first section for details.*

## Post Production

In the week following the Dedication there are all kinds of loose ends to be dealt with. Just when you think that it's DONE, it is not done.

E-mail must be sent to all of the people who work sound explaining how to work with the new pulpit. It's not hard, but they won't know if they're not told:

Hello All,

UUFRC has a new Pulpit, and the mechanics of setting up the microphone are a little different. It would be best if I could show each of you what needs to be done, but lacking that I want to send this written announcement.

### 1) Materials

- \* Microphone - We are using the same microphone as with the old lectern and it is stored in the same place; the white shelf in the locking sound cabinet.
- \* Light - This is new, and I don't think we will use it very often. It is stored on the shelf with the microphone.
- \* Cable - There is a custom built cable that contains an XLR cable for the microphone and DC power for the light wrapped in a black mesh. This is kept on a large hook in the area behind the center of interest, above and to the right of the "snake" break-out box. The end of the cable with the two short wires goes to the pulpit; the end with the longer leads goes to the break-out box.
- \* Power Supply - The light uses a "wall wart" switching power supply for power. It is stored on the hook with the cable.
- \* Extension Cord - Until we get an electrical outlet installed next to the break-out box, we use a short brown extension cord that runs from the outlet at the back of the chance. This is stored on the hook with the cable.

### 2) Mixer

There are no changes of mixer settings with the new pulpit.

### 3) Set Up

The pulpit contains its own wiring for microphone and light.

- \* The XLR style sockets on the Reader Board are different so there is no chance of plugging them in the wrong way: microphone on the left w/ 3-pin connector; light on the right w/ 4-pin connector.
- \* Adjust the microphone so that it goes from the socket towards the front center then turns towards the speaker.
- \* The pulpit connection for the XLR cable to the break-out box and light is located under the bottom shelf - sorry, its down low so you will have to get on your hands and knees to make this connection. The walnut mounting block has a 3-pin XLR connection and a DC power socket. There is also a "stress relief" facility.
- \* Feed the cable (the end with the two short leads) around the back of the step, around through the stress relief twice, and then plug into the sockets.
- \* From back of the step, the cable runs along the top right side of the base, and under the brass retaining clip.
- \* The cable is then routed across the chancel floor to the back, under the edge of the table at the back, and then up to the break-out box.

Don't install the light unless the speaker asks for it. It will not be needed except for special occasions when the room is intentionally darkened. If the light is needed, then use the brown extension cord to get the power supply plugged in at the back of the chancel. The output of the power supply goes to the connector that leaves the wrapping for the cable. You will see it - it's easy.

### 4) Break Down

Simple - Return all the materials from where you got them!

Lightly coil the cable and hang it on the big hook, this is the hardest part.

I recommend that you take a quick look at the connection point at the bottom back of the pulpit before you have to run sound. That way if you have questions you can contact me before you are in a bind. If I am around I will be happy to show you how its all done.

Respectfully,  
John M. Cooney

-----  
Go with hope,  
go with courage,  
go with love,  
and remember, you are never alone.  
Blessed Be

The ***Book of the Pulpit*** needs to be proofread. Kaye gave it a quick review before we submitted the manuscript for the one-off printing. Now my Dad gives the proof a careful read and finds both errors and omissions, such as, what is a Bessey and what do “biscuits” have to do with woodworking?

I also need to tally how many people want books. The limited print run is going to be expensive, but still, this is a once-in-a-lifetime opportunity! So far, I have 11 orders and am hoping to get a few more. Actually, a run of 20 would be nice.

The book has grown over the last few months. The final statistics come out as follows (these are approximate – ask Microsoft about the inconsistencies):

Document Name	Pages	Words	Editing Minutes	Revisions	K Bytes Storage
Part 1- Introduction.doc	28	4,171	13,388	603	48,873
Part 2 - 2005.doc	22	6,773	6,371	266	17,762
Part 3 - 2006.doc	19	5,202	6,726	267	6,571
Part 4 - 2007.doc	18	5,482	6,575	263	4,263
Part 5 - 2008.doc	29	8,761	7,747	316	17,963
Part 6 - 2009.doc	48	16,621	6,618	322	83,004
Part 7 - Back Cover.doc	2	80	150	6	997
<b>Total:</b>	<b>166</b>	<b>47,090</b>	<b>47,575</b>	<b>2,043</b>	<b>179,433</b>

Production PDF file size: 4,500KB

Will this ever really end?

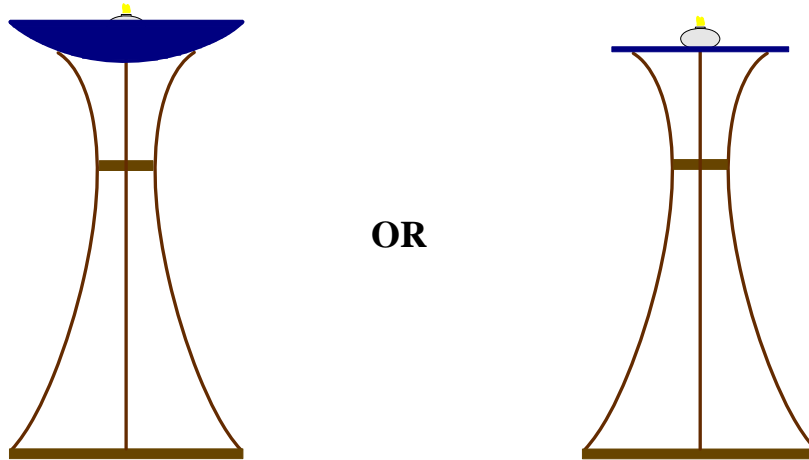
# The End

Well not quite – we do have another project in mind.

The old Pulpit had the desk surface on which to put our chalice, but with the new Pulpit there is no such surface. So an additional piece of furniture is needed.

A Chalice Table!

Perhaps something that follows the lines of the new pulpit.



We will see what evolves.

**Life in the shop is good!**





The Builders:  
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